Department of Energy

Idaho Operations Office
785 DOE Place
Idaho Falls, Idaho 83402

June 4, 1991

Mr. Michael Gearheard, Chief
Waste Management Branch
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

SUBJECT: Closure Plan for CPP-33, Contaminated Soil in Tank Farm Area Near WL-102, NE of CPP-604 - ERD-210-91

Dear Mr. Gearheard:

This correspondence forwards the Closure Plan for CPP-33, Contaminated Soil in Tank Farm Area Near WL-102, NE of CPP-604 to your office for review and approval. This plan evaluates the results of waste characterization activities completed at the site, identifies the absence of RCRA hazardous constituents in and around the unit at concentrations threatening to human health and the environment, and recommended at this site under provisions of the COCA. Additional activities will be conducted at this site to address residual radioactivity under provisions of the Interagency Agreement (IAG).

If you have any questions, please contact W. N. Sato at (208) 526-0193 or L. A. Green at (208) 526-0417.

Sincerely,

T. F. Burns, Jr.
Deputy Assistant Manager
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Enclosure

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CLOSURE PLAN FOR LAND DISPOSAL UNIT CPP-33

CONTAMINATED SOIL IN TANK FARM AREA NEAR WL-102, NE OF CPP-604

MAY 30, 1991

IDAHO NATIONAL ENGINEERING LABORATORY
DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICE

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LIST OF ACRONYMS

ANSI/ASME	American National Standards Institute/American Society of Mechanical Engineers
BGL	Below Ground Level
CEP	Controls for Environmental Pollution, Inc.
cmp	counts per minute
COCA	Consent Order and Compliance Agreement
CSWP	Construction Safe Work Permit
DOE-HQ	U.S. Department of Energy Headquarters in Washington, D.C.
DOE-ID	U.S. Department of Energy, Idaho Operations Office
DOT	U.S. Department of Transportation
DPE	Drilling Project Engineer
EPA	Environmental Protection Agency
FFA/CO	Federal Facilities Agreement/Consent Order
FPR	Fuel Processing Restoration
GAI	Golder Associates Inc.
HEA	Health Environment Assessment
HP	Health Physics Personnel
I.D.	Inside Diameter
ICPP	Idaho Chemical Processing Plant
INEL	Idaho National Engineering Laboratory
LDU	Land Disposal Unit
LPG	Lead Project Geologist
NQA-1	Quality Assurance Program Requirement for Nuclear Facilities
O.D.	Outside Diameter
OVA	Organic Vapor Analyzer
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Program Plan
QASP	Quality Assurance Sampling Plan
RCRA	Resource Conservation and Recovery Act
RDF	Chronic Reference Dose
RPD	Relative Percent Difference
SRPA	Snake River Plain Aquifer
SWMU	Solid Waste Management Unit
TCLP	Toxic Characteristic Leach Procedure
TIC	Tenatively Identified Compounds
USDA	United States Department of Agriculture
UTL	Upper Tolerance Limits
UURI	University of Utah Research Institute
VMF	Vehicle Monitoring Facility
WINCO	Westinghouse Idaho Nuclear Company
RWMC	Radioactive Waste Management Complex

EXECUTIVE SUMMARY

This closure plan is being submitted to comply with the Idaho National Engineering Laboratory (INEL) Consent Order Compliance Agreement (COCA), which requires the submittal of a closure plan for each Land Disposal Unit (LDU). LDU CPP-33 is located near the northeast corner of building CPP-604. Radioactively contaminated soil was discovered at the site during excavation for the new Process Equipment Waste (PEW) evaporator building in (addition to 604) 1974. The contamination was attributed to releases from a corroded 4-foot section of the 12-inch carbon steel pressure relief line, 12 feet below grade, running from the waste tank storage area to the ICPP stack. An additional 3- to 6-foot of the pressure relief line was in lesser stages of corrosion. The contamination diffused vertically in plumes to a depth of approximately 16 feet and horizontally in "fingers" which followed sand-filled lenses to approximately 20 feet. It was estimated that approximately 1,000 to 3,000 curies (Ci) of activity were released into the soil, which resulted in the removal of approximately 250- to 300-yd^3 of soil to the INEL Radioactive Waste Management Complex (RWMC). Some contamination was reportedly left at the site. Wastes associated with LDU CPP-33 are the same as those known or suspected in the vicinity of the Tank Farm. These wastes potentially include acids, 4-methyl-2-pentanone, metals and radionuclides.

Additional contaminated soil was encountered during the summer of 1983, during excavation to replace tank WL-102, which was also located near the northeast corner of building CPP-604. This contamination was also attributed to the releases from the corroded pressure relief line discovered in 1974. Approximately 14,000 cubic yards of soil was excavated for the replacement task. About 2,000 cubic yards of soil exceeded 30 mR/hr and was sent to the RWMC for disposal. The remaining 12,000 cubic yards of soil was moved in August-September 1984 and disposed in a trench (LDU CPP-34) in the northeast corner of the ICPP. After excavation the area was backfilled and a portion of CPP-33 was paved over with an asphalt road.

LDU CPP-33 was characterized in accordance with the INEL COCA. CPP-33 was listed as an LDU because of the potential presence of RCRA hazardous wastes/constituents and radionuclides in the underlying strata resulting from releases from a corroded 4-foot section of a pressure relief line running from the Waste Tank Storage area to the ICPP stack. The unit has been determined from an assessment of contaminated soil incident reports, personal interviews, and ICPP drawings. Based on this assessment the releases from the corroded pipe occurred within the boundary for LDU CPP-33. Although radionuclides are not governed by RCRA, radiological analyses were performed to determine if the radiological contamination present at the unit posed an unacceptable risk to human health, safety or the environment.

Analysis of soil samples from one borehole (113.6 feet deep) located within LDU CPP-33 was conducted to determine the presence of RCRA hazardous wastes/constituents and radionuclides. In addition, a lysimeter and monitoring well, installed at LDU CPP-33, will provide water samples allowing surveillance of dissolved constituents. This surveillance is part of an overall hydrogeologic characterization of the Tank Farm area. To

date, five monitoring wells and five lysimeters have been installed as part of the program. Validated soil sample analysis results are included in this closure plan. Three inorganic hazardous constituents (cadmium, lead, and mercury) were detected above background Upper Threshold Limits (UTL). Cadmium was detected in five samples, lead in three, and mercury in all but three samples. Although analytical results show that cadmium, lead, and mercury were detected above the UTL none were found exceeding the maximum allowable soil concentrations based on the Chronic Reference Dose (RfD) (EPA, 1990b). Organic analysis identified trichloroethene in one sample, below the contract required quantitation limit for soils. No other organic contaminants were encountered.

Sample analysis results have also detected numerous radioactive contaminants, including cesium-137, neptunium-237, strontium-90, uranium-234, and uranium-238.

A Health and Environmental Assessment has been performed for the hazardous constituents detected at CPP-33. The hazardous constituents detected (cadmium, lead, mercury, trichloroethene) however, are not in concentrations that pose an unacceptable risk to human health, safety, or the environment. The presence of radionuclides will be evaluated under the upcoming Federal Facilities Agreement/Compliance Order (FFA/CO). With respect to radioactive contamination, applicable DOE Orders will be addressed and incorporated as needed.

Since RCRA hazardous wastes/constituents were detected at levels below those that would pose a threat to human health, safety or the environment, no remediation or post-closure should be required. Therefore, clean closure is recommended and no further action is required.

1.0 FACILITY CONDITIONS

1.1 Idaho Chemical Processing Plant

The Idaho Chemical Processing Plant (ICPP) is a facility at the Idaho National Engineering Laboratory (INEL), located within a fenced security area of more than 200 acres. The primary mission of the ICPP, which began operations in 1953, has been for reprocessing of nuclear fuel, recovery of uranium and krypton, and management of the generated waste. The location at the INEL of the ICPP is shown on Figure 1-1.

1.2 General Description

Land Disposal Unit (LDU) CPP-33 is located near the northeast corner of building CPP-604 as shown on Figure 1-2. A more detailed view of the unit is shown in Figure 1-3. Radioactive contaminated soil was discovered at the site during excavation for the new Process Equipment Waste (PEW) evaporator building in 1974. The contamination was attributed to releases from a corroded 4-foot section of the 12-inch carbon steel pressure relief line running from the waste tank storage area to the ICPP stack. An additional 3 to 6 feet of the pressure relief line was in lesser stages of corrosion. The top of the corroded line and the area of high level contaminated soil were reached at a depth of approximately 12 feet below grade. The contamination appears to have diffused vertically in plumes to a depth of approximately 16 feet and horizontally in "fingers", which followed sand-fill lenses to approximately 20 feet. Several fingers of contaminated soil which followed sand "lenses" were discovered. Typically these fingers were a few inches to a foot in thickness and traveled several feet. Two of the largest of these fingers resulted in significant activity as much as 10-15 feet from the main column of contaminated soil and temporarily raised the question of the possibility of multiple sources. Since (1) further excavation better delineated the extent and pattern, (2) no other leaking pipes or sources were found, and (3) the contamination composition was consistent with the main body of the source, it was concluded that the one leaking pipe was the only source.

It is estimated that approximately 1,000 to 3,000 curies (Ci) of activity were released into the soil, which resulted in excavation of approximately 250 to 300 cubic yards of soil to the INEL Radioactive Waste Management Complex (RWMC). However, some contamination was reportedly left at the site (WINCO, 1974).

The approximate location of the 1974 and 1983 excavations (discussed below) are shown in Figure 1-3. A photograph of the 1974 excavation is shown in Figure 1-4 which, when viewed along with Figure 1-5, provides:

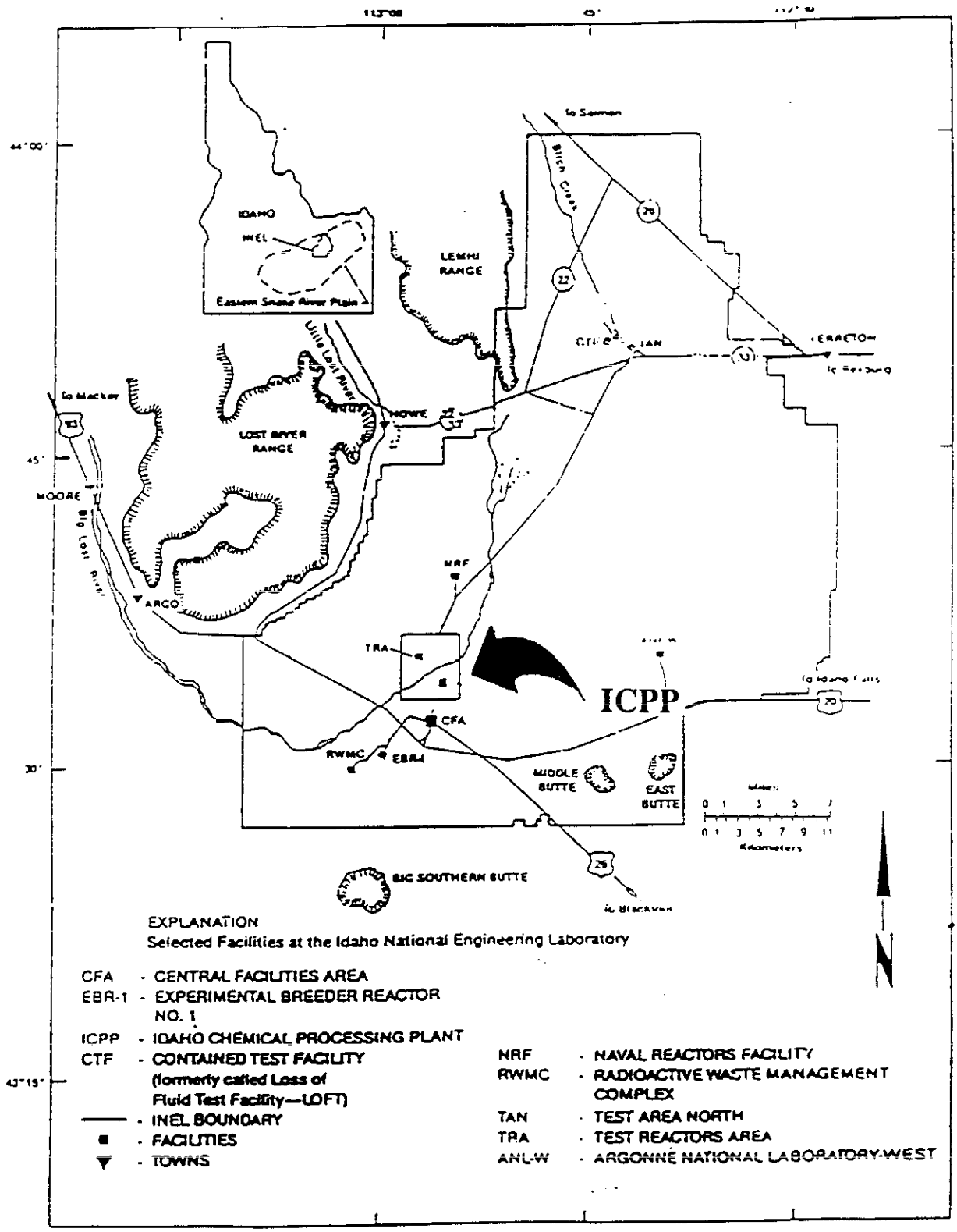
- A sense of the size and depth of the pit,
- A photograph of excavated facilities after most of the hot soil had been removed, and
- A sketch of excavated facilities along with the level of radioactivity measured in the surrounding soil.

Additional contaminated soil was encountered during the summer of 1983, when work was conducted to replace tank WL-102, which was also located near the northeast corner of building CPP-604. This contamination was also attributed to the releases from the corroded pressure relief line discovered in 1974. Approximately 14,000 cubic yards of soil was excavated from CPP-33. About 2,000 cubic yards of soil exceeded 30 mR/hr and was sent to the RWMC for disposal. The remaining 12,000 cubic yards of soil was moved in August to September 1984 and was disposed in a trench (LDU CPP-34) in the northeast corner of the ICPP. After excavation, the area of CPP-33 was backfilled, and a portion of it was paved over with an asphalt road. However, trace amounts of radioactively contaminated soils were reportedly left at the site below and outside the excavated area (Ikenberry, 1984). During recent drilling activities to characterize this Land Disposal Unit (LDU), buried objects were encountered at depths of 33, 13, and 29 feet below ground level (BGL). Workmen in the area reported the bore holes were located in line with a column of I-beams (possibly similar to those identified in Figure 1-4 as "New Piling") which had been cut off beneath the surface. Apparently soils in the vicinity of LDU CPP-33 had been excavated to depths of at least 33 feet, possibly down to the basalt.

In summary, the unit has been determined from an assessment of contaminated soil incident reports, personal interviews, and ICPP drawings. Based on this assessment the releases from the corroded pipe occurred within the boundary for LDU CPP-33 noted on Figures 1-3 and 6-1. these releases occurred from the pressure relief line, located 12 feet below grade. The contamination diffused vertically in plumes to a depth of approximately 16 feet and horizontally in "fingers" which followed sand-fill lenses to approximately 20 feet.

1.3 Unit Characterization Objectives

LDU CPP-33 was characterized in accordance with the INEL Consent Order and Compliance Agreement (COCA). CPP-33 was listed as an LDU because of the potential presence of Resource Conservation and Recovery Act (RCRA) hazardous wastes/constituents and radionuclides from approximately 12 to 28 feet below grade, that resulted from releases from a corroded 4-foot section of a pressure relief line running from the Waste Tank Storage area to the ICPP stack. Although radionuclides are not governed by RCRA, radiological analyses were performed to determine if the radiological contamination present at the unit posed a risk to human health, safety or to the environment. The primary objectives for the characterization of LDU CPP-33 were to 1) determine the nature and vertical extent of contamination due to the release of RCRA hazardous and radiological



Note: LDU CPP-33 is located at the ICPP

(after Bartholomay, et al, 1989)

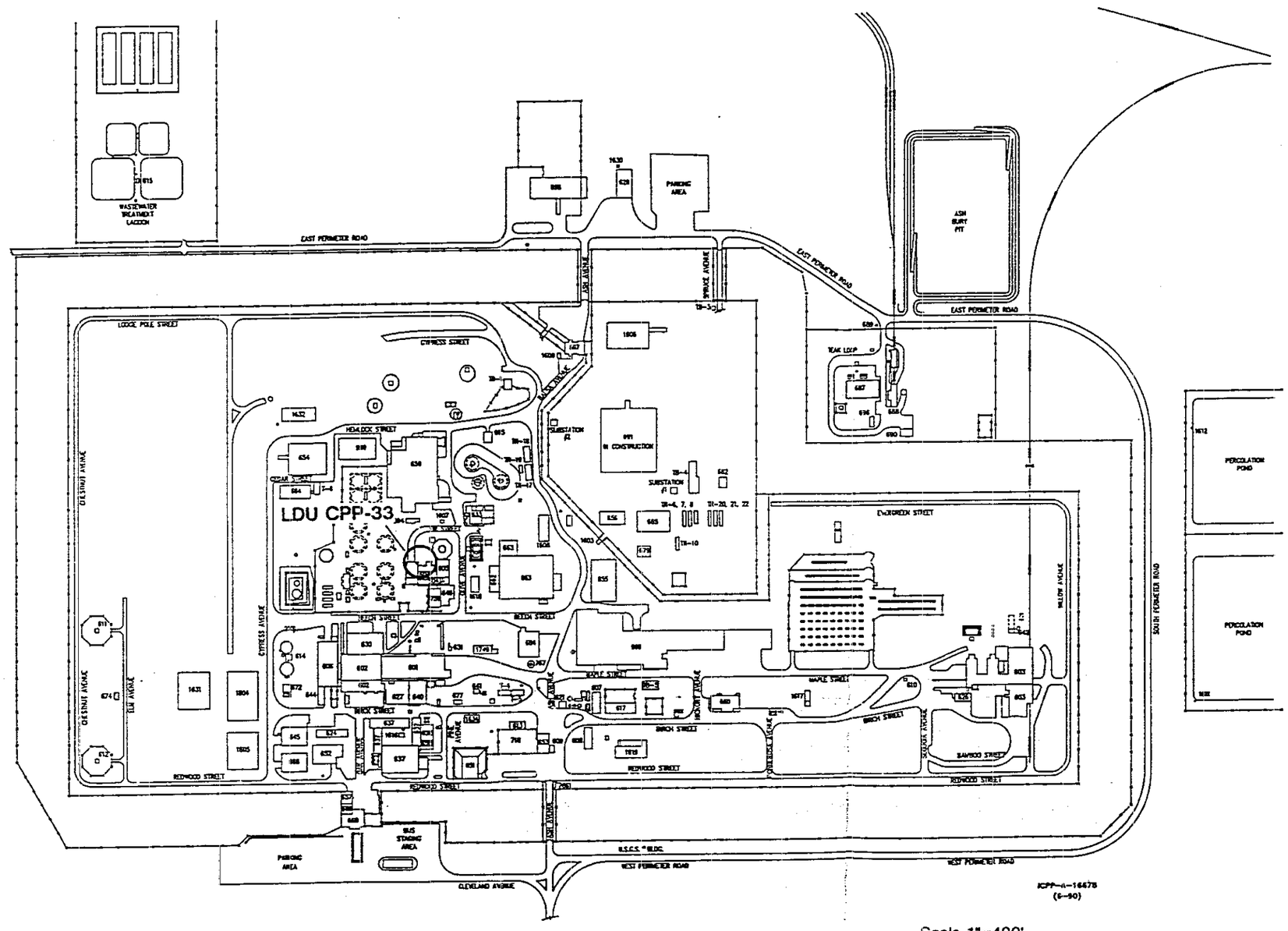
FIGURE **1-1**

GENERAL INEL SITE MAP

EG&G/ICPP-33/ID

PROJECT NO. 863-1195.850 DWG. NO. 23025 DATE 1/28/91 DRAWN DC

Golder Associates



Scale 1"=400'

N

0 400 800

Feet

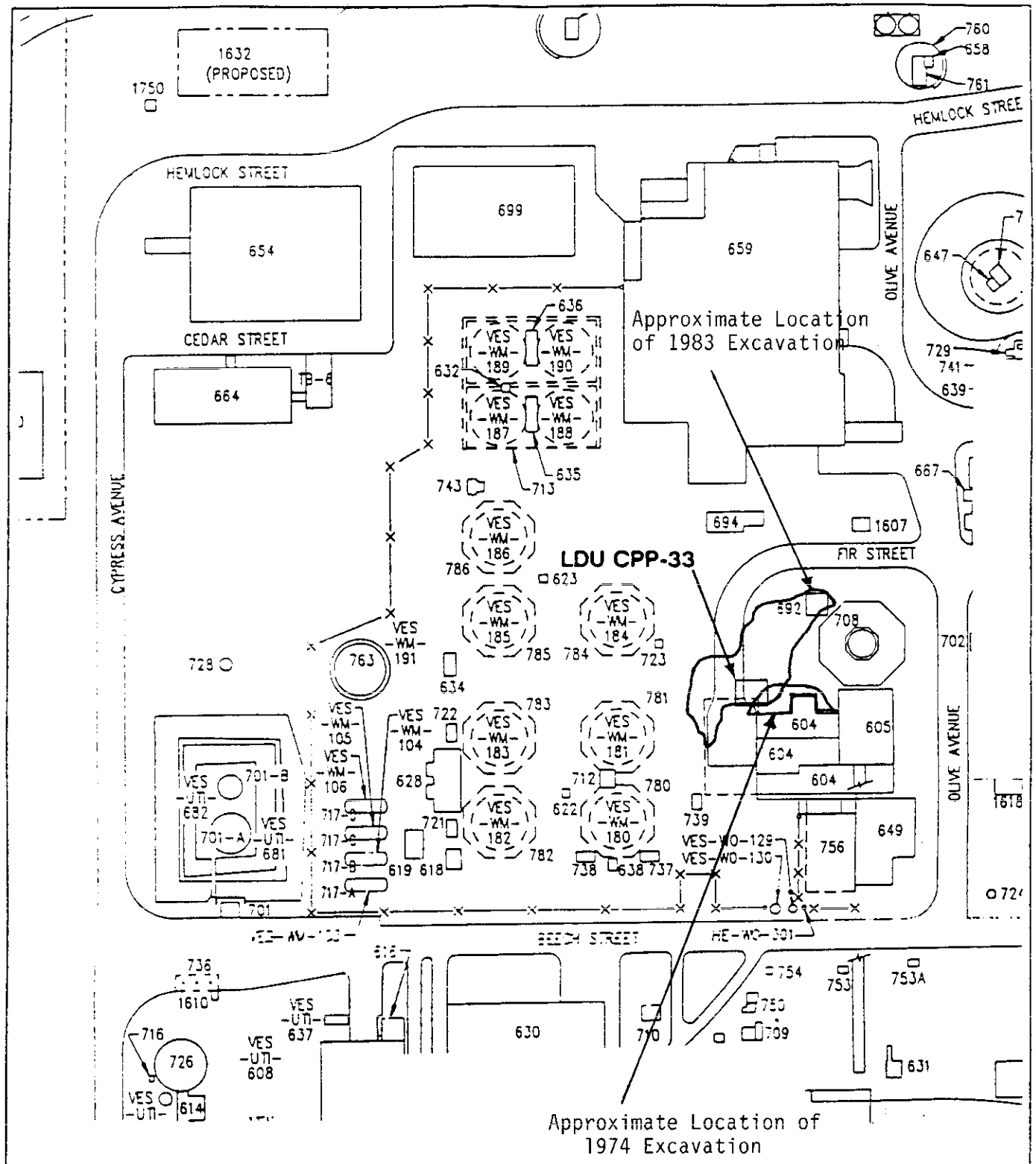
FIGURE **1-2**

ICPP SITE PLAN

EG&G/ICPP-33/ID

PROJECT NO 893-1195.850 DWG NO 23658 DATE 4/1/91 DRAWN TK

Golder Associates



0 125 250
Feet

FIGURE **1-3**
LOCATION OF LDU CPP-33
EG&G/ICPP-33/ID

PROJECT NO. 893-1195.850 DRAWING NO. 24812 DATE 4/3/91 DRAWN BY TK

Golder Associates

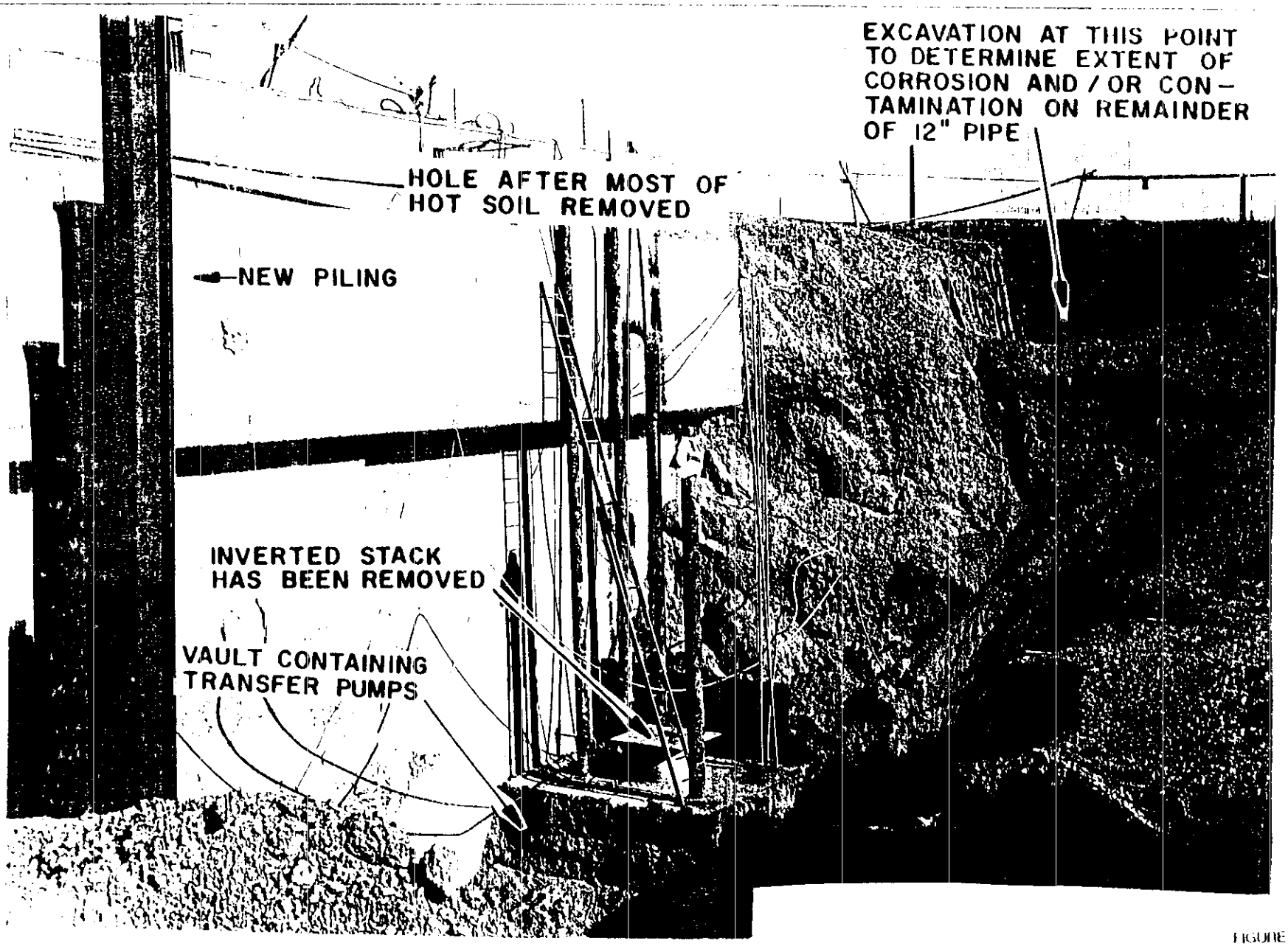


FIGURE 1-4

PHOTOGRAPH OF 1974 EXCAVATION AT LDU CPP-33

EG&G/ICPP-33/0

PROJECT NO 853 1150 850 DWG NO 23667 DATE 4/24/91 DRAWN HP

Golder Associates

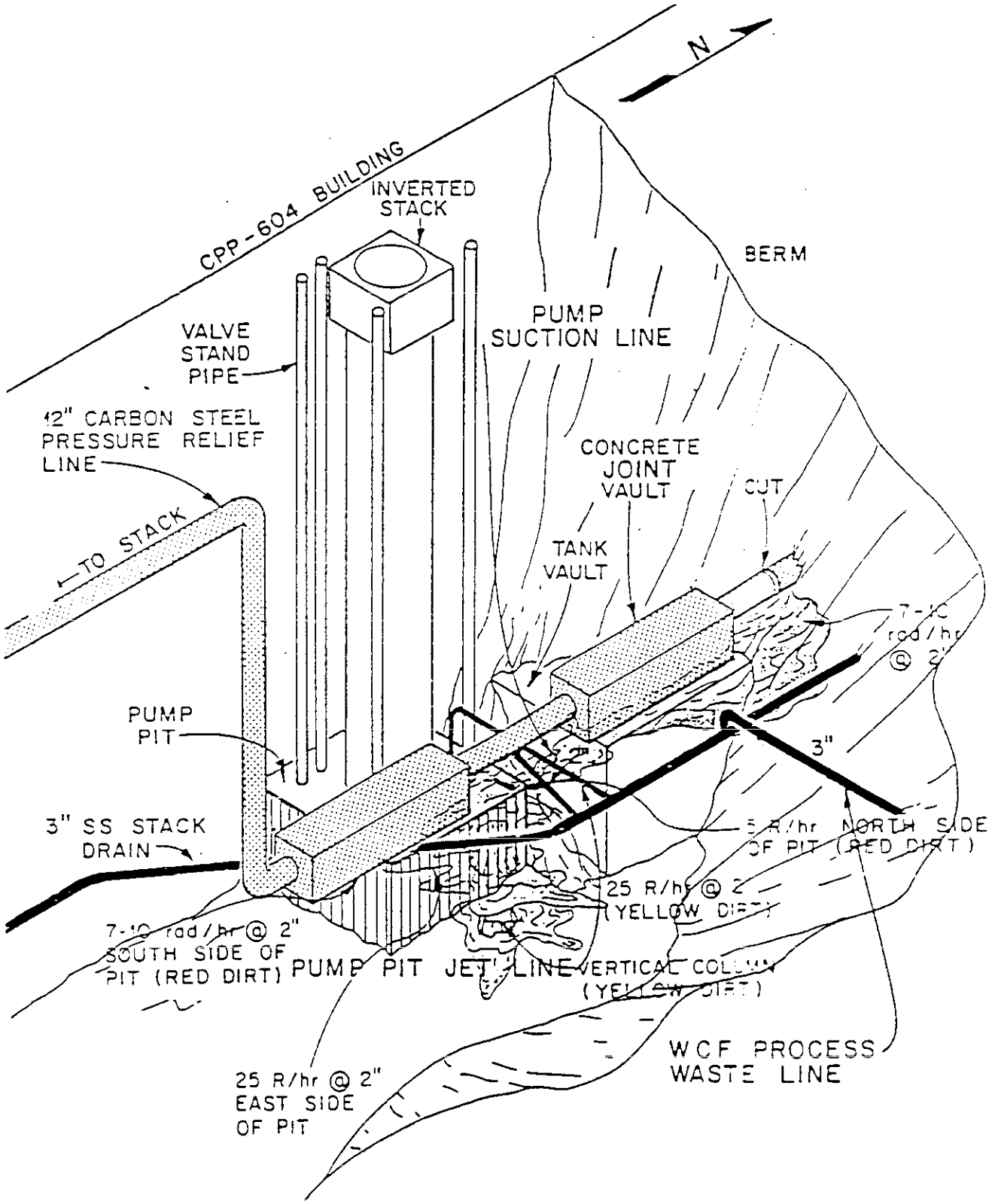


FIGURE 1-5

DIAGRAM OF LDU CPP-33 RELEASE

EG&G/ICPP-33/ID

PROJECT NO 893-1195.850 DWG NO 23668 DATE 4/24/91 DRAWN HP

Golder Associates

wastes/constituents into the soil column and 2) determine if the contamination present poses an unacceptable risk to human health and safety or the environment. Since the area of concern had been previously excavated, the possibility of encountering contamination was considered minimal. In addition, the physical constraints associated with this area (i.e., numerous under underground utilities, obstacles, steep embankments), limited the placement of boreholes. The primary reason for limiting drilling was to prevent rupturing existing lines and allowing the potential exposure and release of high level waste. Therefore, boreholes were initially scheduled to meet these objectives. The first borehole would be used for analytical testing of the soils and the second for placement of a lysimeter for long term monitoring. In order to maximize characterization efforts, the first borehole was also to be converted into a monitoring well. The monitoring well and lysimeter are each one of five monitoring wells and lysimeters which shall be used for overall characterization of hydrogeologic conditions of the entire tank farm area. To date all monitoring wells and lysimeters have been installed as part of the separate hydrogeologic characterization.

1.4 Closure Determinations

Unit closure will be based on the presence of hazardous waste as defined by RCRA or concentration of hazardous constituents and the level of risk posed to human health and safety and/or the environment. If hazardous wastes are not detected or hazardous constituents are present in quantities that do not pose an unacceptable risk to human health and safety or the environment, a proposal will be submitted to the Environmental Protection Agency (EPA) and the State of Idaho requesting clean closure. Soil will not be removed.

If the contaminant concentrations analyzed for pose an unacceptable risk to human health and safety or the environment, all contaminated soil that exceed the regulatory or risk-based levels will be excavated and disposed of according to the applicable regulations. The unit would be clean closed and soil removed in accordance with the requirements of 40 CFR 265, Subpart G (Closure and Post-Closure).

Because of the corrosivity, heavy metal content, and organics of the waste stream associated with the Tank Farm, the action level requiring RCRA closure of LDU CPP-33 will be based on the pH of the soils and/or the presence of metals and organic compounds above Toxicity Characteristic Leach Procedure (TCLP) limits. The action level associated with pH is less than or equal to 2 or greater than or equal to 12.5. Additional action levels for other hazardous constituents such as 4-methyl-2-pentanone (MIBK) will be based on an unacceptable risk to human health and safety. Although radionuclides are not governed by RCRA, radiological analyses, and a health and environmental assessment will be performed to determine if the radiological contamination present at the unit pose a risk to human health, safety, or the environment. If such a radiological risk is identified, the unit will be evaluated under the INEL Federal Facilities Agreement Consent Order (FFA/CO) to determine if remediation or monitoring activities are required.

1.5 Closure Goals

The closure goal for CPP-33 will be to clean close. This decision will be dependent on sampling results. If results of sampling indicate levels above regulatory limits, a significant health and safety impact or an unacceptable environmental hazard, excavation and removal or decontamination may be required. Therefore, if required, the goal will be to clean close the site by decontaminating and/or removing all facility equipment and contaminated soils.

2.0 GEOLOGY

2.1 General Geology

The ICPP is located on alluvial materials deposited by the Big Lost River. Surficial sediments at the ICPP can be divided into two distinct layers. The surface layer to a depth of 35 to 40 feet is a gravel to gravelly sand that averages about 60 percent gravel and 40 percent sand. This coarse surface layer is underlain in many places with a layer (0 to 10 feet) of finer grained materials composed of clayey sands and sand-clay mixtures that directly overlie the basalt. The fine grained layer has an average sand content of 33 percent and an average silt-plus-clay content of 64 percent. The interface between surficial sediments and underlying basalt generally occurs at a depth of 40 to 50 feet below the original land surface (WINCO, 1989a and WINCO, 1989b).

Underlying the surficial sediments are 2000 to 3000 feet of basalt flows with interbedded sedimentary materials. One of the most important of these sedimentary interbeds is a clayey layer that locally occurs at a depth of about 110 feet below ground level (BGL) and, although variable in thickness, may be 15 to 30 feet thick. The interbed commonly consists of moderate reddish to yellowish brown, damp, non-stratified, stiff to hard, silty clay to clayey silt (GAI, 1991c). This interbed is continuous over a large area of the INEL and may be expected to be locally continuous under the ICPP (Hull, 1988).

The sequence of interbedded basalt and sediments continues to well below the water table. There is some evidence of a sedimentary bed at a depth of 750 feet below land surface, which may be the effective bottom of the Snake River Plain Aquifer (SRPA) below the ICPP (WINCO, 1989a and WINCO, 1989b).

Fractures in the basalts commonly have silt and clay filling material where the basalt has been exposed on the surface. There are also volcaniclastic layers within the basalts that are composed primarily of sand- and gravel-sized material. Sedimentary interbeds are likely to be composed of sand- silt- and clay-sized materials (WINCO, 1989a and WINCO, 1989b).

2.2 Site-Specific Geology

As described in section 1.2, approximately 14,000 cubic yards of soil were excavated from the site, resulting in a pit that extended down to a depth of at least 33 feet BGL. Based on the color, aggregate composition and size range of the particles, anthropogenic fill at LDU CPP-33 is probably derived from nearby sources and is therefore similar in composition to undisturbed alluvium, found elsewhere in the vicinity of the site.

Based upon visual observation of core samples taken at CPP-33-1, the following is a description of the lithology beneath the site. The lithologic log for this borehole is included in Appendix A. Shallow (0 to 20 feet BGL) soil samples from the test boring on site consist of very loose to compact, unstratified, fine to coarse sand and fine to medium gravel with trace (< 5 percent) to little (5-12 percent) silt and localized zones of some (12-30 percent) silt. With depth, the sand content was seen to increase, comprising greater than 50 percent of the alluvium, while the coarser fraction (i.e., gravel) generally varied from 12 to 30 percent. The soils overlying the alluvium-basalt contact (which occurred at 48.2 feet BGL) were moist, dense sand, some silt (12 to 30 percent), with trace clay (0 to 5 percent).

Pore water content was described as moist (i.e., adequate moisture content to moisten the hand) throughout the alluvial material with exceptions noted above 6 feet and at 16 feet BGL (see Appendix A). Above 6 feet, the soils were damp (i.e., enough moisture present to darken the appearance, but no moisture or materials adhere to the hand), and at 16 to 18 feet the soils were wet (i.e., visible water present).

The basalt under LDU CPP-33 is a fresh, medium dark gray to dark gray, vesicular, aphanitic, medium strong rock with scattered fractures and localized more fractured (rubble) zones (see Appendix A). Fracture surfaces were commonly found to have thin (1 mm or less), yellowish brown, clayey linings, which have a significant capacity for ion exchange and adsorption. These clayey linings were commonly the sites of significant concentrations of radionuclides, as indicated by the data seen in Tables 6-4 and 6-5. Table 6-4 presents the results of field

radiological surveys (conducted with hand-held beta-gamma detection equipment) upon fracture lining material. The radionuclide sample results are included in Table 6-5.

In general, the basalt was damp to moist. No standing water was observed to have collected at the bottom of the borehole during the drilling process, which extended over a 22-day period. Apparently the basalts underlying LDU CPP-33, at this time, are not in hydraulic connection with the perched waters seen elsewhere in the vicinity of the ICPP.

The first sedimentary interbed in the basalt is at 108.5 feet below the surface. Drilling was terminated at 113.6 feet below surface in the interbed (GAI, 1991a, 1991b). Drilling was terminated at this depth for two reasons; 1) To improve the geological/stratigraphical understanding of the ICPP site, and 2) To assure penetration of the stratigraphically equivalent zone associated with perched water in the Tank Farm area. The interbed consists of stiff moderate reddish brown, unstratified, silty clay underlain by stiff, moderate yellowish brown, unstratified clay. The thickness of the interbed below LDU CPP-33 is unknown.

3.0 HYDROLOGY

3.1 Surface Water

The Big Lost River is the major surface water feature on the INEL with its headwaters located west of the site. The Big Lost River flows to the southeast past the town of Arco, Idaho, onto the Snake River Plain, then turns to the northeast, flowing onto the INEL and terminating in three playa lakes. As the river flows onto the plain, the channel branches into many distributaries, and the flow is spread broadly, losing water by infiltration into the channel bottom (Pittman, 1988). The Big Lost River is ephemeral and flows onto the site only during periods of high runoff. The last time flow reached the area of the ICPP was in 1987. The INEL Diversion Dam, constructed in 1984, is located approximately 9 miles upstream from the ICPP (Figure 3-1). It was designed to control flooding on the INEL site by diverting water into designated spreading areas.

Surface water at CPP-33 typically occurs during precipitation events. Water flows from roof drains on surrounding buildings onto the LDU. Due to the low average annual precipitation rate of 9.07 inches and the coarse nature of the soils, surface water typically dissipates through infiltration into the soil column rather than through runoff.

3.2 Groundwater

The depth to the water table of the Snake River Plain Aquifer (SRPA) at the ICPP is approximately 450 feet below land surface, based on 1990 water level measurements (Golder Associates Inc., 1990d) The direction and rate of groundwater movement in the vicinity of the ICPP are well documented from monitoring contaminant plumes in the Snake River Plain Aquifer. The direction of flow in the vicinity of the ICPP is generally from north-northeast to south-southwest. The rate of flow ranges from 5 to 15 ft/day (WINCO, 1989a and WINCO, 1989b).

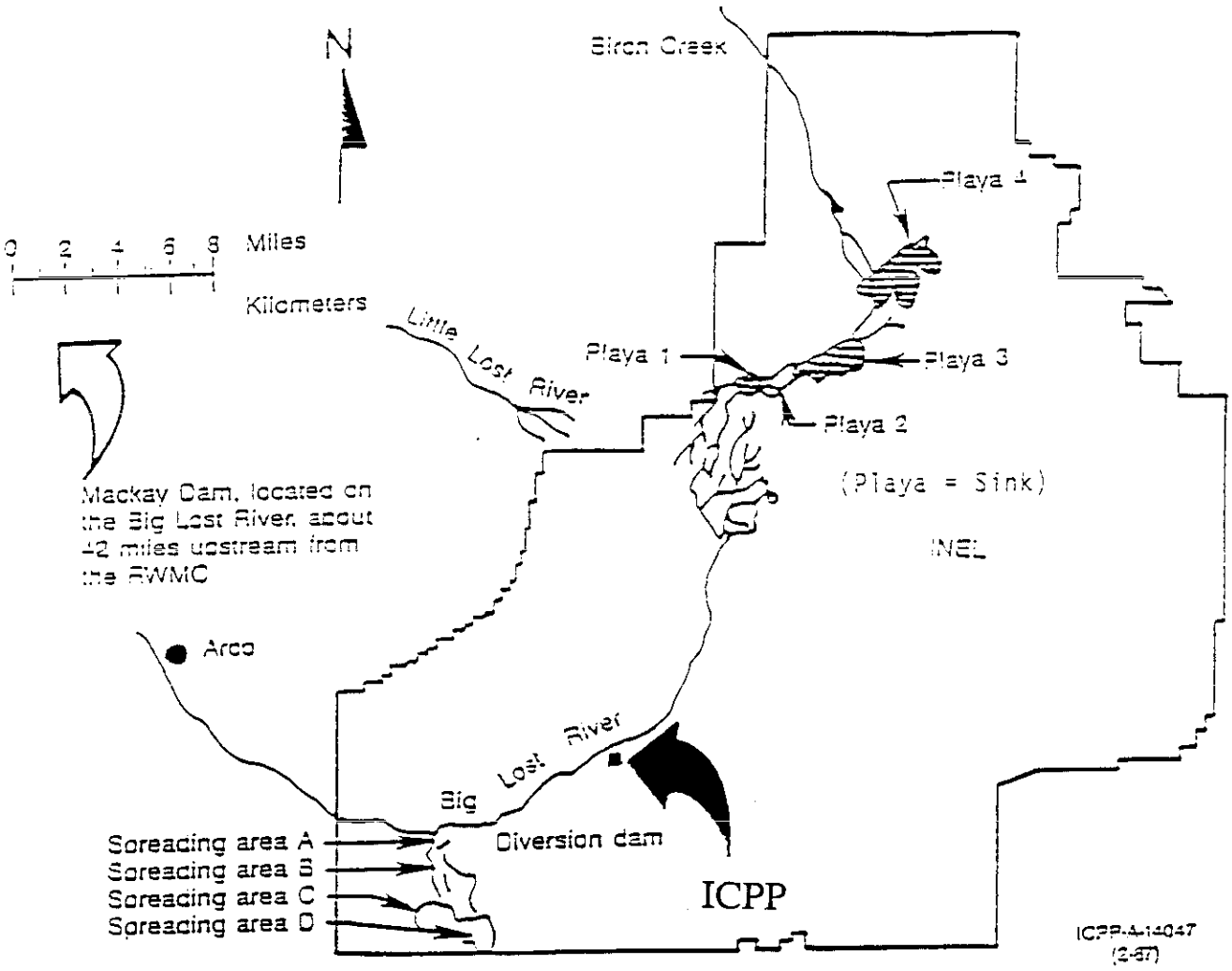


Figure 3-1 Surface water features at or near the INEL (Robertson, et al., 1974)

Perched groundwater zones are known to exist below the ICPP. One perched zone, described by Hull, 1988, is located at an approximate depth of 40 feet at the contact between the surficial alluvial sediments and the uppermost Snake River Plain basalt flow. The groundwater is locally perched by a silty/clayey layer overlying the basalt. Recent drilling in the Tank Farm area has not encountered groundwater perched at this interface.

A second zone is located along the top of a low-permeability sedimentary interbed located at approximately 110 feet BGL. This perched zone does not appear to be laterally continuous under the ICPP. Although previous drilling at the ICPP has encountered this perched zone, several boreholes in the vicinity of the tank farm gave no indication that this perched water was intercepted.

Preliminary results from drilling activities in the Tank Farm area have also identified several perched zones that have developed within vesicular zones overlying the relatively impermeable massive basalt. These perched groundwater zones occur irregularly within the Snake River Plain basalts. In general, the interconnection, direction of flow, and extent of these perched zones is not currently known. The final report describing this interpretation is currently being prepared.

4.0 METEOROLOGY

4.1 Temperature

Average monthly maximum temperatures at the INEL range from 87°F in July to 28°F in January. Average monthly minimum temperatures range from 49°F in July to 4°F in January. The warmest temperature recorded was 101°F, and the coldest temperature through January 1982 has been -40°F (Clausen, Ricks, Start, 1989).

4.2 Wind

The average wind speed at the INEL is about 5 miles/hr in December and maximum of 9 miles/hr in April and May. The highest maximum hourly average speed was 51 miles/hr, measured at the 20-foot level at the Central Facilities Area (CFA) from the west-southwest. Peak gusts of 78 and 87 miles/hr have been observed. Calm conditions prevail 11 percent of the time (Clausen, Ricks, Start, 1989).

4.3 Precipitation

The average annual precipitation at the INEL is 9.07 inches of water. The yearly totals range from 4.50 to 14.40 inches. Individual months have had as little as no precipitation to as much as 4.42 inches. Maximum observed 24-hour precipitation amounts are less than 2.0 inches, and maximum 1-hour amounts are just over 1.0 inch (Clausen, Ricks, Start, 1989).

About 26.0 inches of snow fall each year. The maximum yearly total was 40.9 inches, and the smallest total was 11.3 inches. The greatest 24-hour total snowfall was 8.6 inches. The greatest snow depth observed on the ground was 27 inches (Clausen, Ricks, Start, 1988). January and February average about 7.0 inches for a monthly maximum snow depth on the ground. The ground is usually free of snow from mid-April to mid-November.

4.4 Evaporation

While extensive evaporation data has not been collected on the INEL, evaporation information is available from the towns of Aberdeen and Kimberly, both located on the Snake River Plain in southeastern Idaho, and which have climatic conditions similar to the INEL. The data from these areas is representative of the INEL region and indicates that the average annual evaporation rate is about 42 inches. Recent data from Rexburg, Idaho, located approximately 75 miles east northeast of the ICPP indicates a similar evaporation rate. About 80 percent of the evaporation, 29 in/yr, occurs from May through October (Clausen, Ricks, Start, 1988).

4.5 Summary

The above information is provided as a general overview of the climatic conditions at the ICPP. Relatively small volumes of moisture are available for transport of hazardous or radioactive constituents to the underlying soils and/or aquifers (Thomas, 1988, estimates an average annual recharge rate equal to 0.5 in/yr). Thus, there would be weak hydraulic driving conditions to force the migration of contamination in the subsurface.

5.0 KNOWN OR SUSPECTED WASTE TYPES

5.1 Chemical-Hazardous Waste

Wastes associated with LDU CPP-33 are the same as those known or suspected in the vicinity of the ICPP Tank Farm. Wastes stored in the ICPP Tank Farm are generated from reprocessing spent fuel to recover enriched uranium. These wastes potentially include acids, 4-methyl-2-pentanone, metals, and radionuclides (WINCO 1989c). Table 5-1 includes a list of potential waste constituents associated with the ICPP Tank Farm and LDU CPP-33. This list is based on process knowledge.

5.2 Radioactivity

As noted previously in Sections 1.2 and 5.1, radiological contamination was suspected at LDU CPP-33. Radioactive contaminated soil was encountered during construction activities at the site in 1974 and again in 1983. Although much of the radioactive material was removed during excavation and backfilled, trace amounts of radioactively contaminated soils were reportedly left at the site. A drilling and sampling program to characterize the soils underlying LDU CPP-34 (which contains soil excavated from CPP-33) was conducted in January, 1990 (GAI, 1990). Radiological analysis performed on soil samples from the trench fill at LDU CPP-34 detected low concentrations of radionuclides at several depths in almost all borings. Cesium-137 and strontium-90 were the principal radionuclides detected. Those radionuclides associated with tank farm waste are listed in Table 5-1. This list includes all those radionuclides detected at LDU CPP-34. These wastes would be expected in LDU CPP-33.

During site characterization activities, ambient background radioactivity [which ranged from 200 to 500 counts per minute (cpm)] was periodically monitored by WINCO health physics (HP) personnel. They were equipped with hand-held model 61 Ludlum instrumentation to detect alpha activity and model 2A Ludlum counters to detect beta and gamma. In addition, all samples were scanned to detect subsurface radioactive contamination. Elevated radiation levels were detected in alluvial materials from about 6 to 38 feet BGL, and in the basalt from about 72 to 102 feet BGL. Results are presented in Table 6-4.

TABLE 5-1

POTENTIAL CONSTITUENTS ASSOCIATED WITH THE ICPP TANK FARM AND LDU CPP-33

CONSTITUENT	WASTE DESIGNATION
Acids	
Hydrochloric acid	D002
Nitric acid	D002
Sulfuric acid	D002
Hydrofluoric acid	D002, U134
Metals	
Arsenic	D004
Barium	D005
Cadmium	D006
Chromium	D007
Lead	D008
Mercury	D009
Silver	D011
Organics	
4-Methyl-2-pentanone	U161, F003
Radionuclides	RADIATION ENERGY TYPE
Americium 241	Alpha
Antimony 125	Beta, Gamma
Cerium 144	Beta, Gamma
Cesium 134, 137	Beta, Gamma
Cobalt 60	Beta, Gamma
Iodine 129	Beta, Gamma
Neptunium	Alpha, Beta, Gamma
Plutonium 238	Alpha, Beta, Gamma
Ruthenium 103, 106	Beta, Gamma
Strontium 90	Beta
Uranium 234, 235, 236, 238	Alpha
Yttrium 90	Beta

Source: (WINCO 1989c)

6.0 PRE-CLOSURE SAMPLING AND ANALYTICAL RESULTS

6.1 Unit Sampling

To meet the objectives of the sampling program as specified in Section 1.3, four borings were drilled. The first boring was continuously sampled to a depth of 113.6 feet. The second and third borings were drilled to a depth of 13 and 33 feet, respectively. Drilling was halted at these depths due to obstructions encountered. Since the target depth could not be attained, these borings were subsequently grouted. The fourth borehole was drilled to a depth of 29 feet before an obstruction was encountered. Due to these obstructions the third borehole was converted into a lysimeter borehole and the lysimeter installed. The target depth for the lysimeter as specified in the work plan was 40 feet. The borehole location is shown on Figure 6-1. Due to the close proximity of these shallow borings (boring 2-4) to the deep boring, samples were not believed necessary.

Drilling, sampling, and logging of the surficial soils was conducted in accordance with Golder Associates Inc. (GAI) Technical Procedure TP-1.2-5, "Drilling, Sampling, and Logging of Soils." This procedure conforms to, and incorporates those principles and procedures provided by EPA guidance documents (i.e., EPA, 1987a, 8.1.6.1.3 Hollow Stem Augers, 8.1.6.2 Sampling Techniques, 8.1.6.2.1 Split Spoon Samplers, and 8.1.6.2.2 Thin-walled Tube Samplers, EPA, 1986, 3.1 Drilling Methods, and 3.1.1 Hollow-stem Continuous Flight Auger). Soils were identified by the Drilling Project Engineer (DPE) and Lead Project Geologist (LPG) as specified in GAI Technical Procedure TP-1.2-6, "Field identification of Soils" and classified in accordance with U.S. Department of Agriculture (USDA) soil classification procedures included in Table 4-1 of the Quality Assurance Program Plan (QAPP). All samples were handled in accordance with the chain-of-custody procedures specified in GAI Technical Procedure TP-1.2-23.

Hawley Brothers Drilling of Blackfoot, Idaho, was contracted by WINCO to conduct the drilling operations. All work was conducted in accordance with the WINCO Construction Safe Work Permit (CSWP) process. All personnel working at the drill sites wore safety boots, hard hats, and safety glasses. Drilling and sampling

activities related to this borehole were conducted from February 8 through March 1, 1991. The borehole log created by the DPE and LPG and a schematic showing the instrumentation placed downhole are presented in Appendix A (and further discussed in Section 14).

All soil and interbed samples were analyzed for the constituents listed below (detailed lists are included in Appendix D):

- Volatile Organics,
- RCRA Metals and pH, and
- Radionuclides.

All samples were transferred under chain-of-custody to Controls for Environmental Pollution, Inc. (CEP), Santa Fe, New Mexico.

Depths at which soil samples were analyzed are shown in Table 6-2. Results of the analyses and a discussion of the results is presented in Section 6.5.2, 6.5.3, and 6.5.4.

The drill rig was decontaminated prior to entering the ICPP. Decontamination consisted of high-pressure steam cleaning by the drilling contractor at a WINCO-designated area. GAI personnel visually inspected the drill rig and downhole tools before they were brought on site for grease, hydraulic fluid, and other visible materials that could potentially contaminate the borehole.

All auguring at LDU CPP-33 was conducted using a 6.5-inch-inside-diameter, (9-inch-outside) hollow stem auger. Continuous sampling was conducted ahead of the auger as the hole was advanced in 2-foot increments. A soil sample was collected for chemical analysis, beginning at the surface and for each 2-foot interval, down to a depth of 14 feet BGL. These samples were obtained by driving a 24-inch-long, 4-inch-outside-diameter California split spoon sampler containing a 24-inch clear lexan liner. The sampler was advanced by blows from a rig-mounted, cathead-operated, 140-pound hammer. GAI LPG recorded the number of hammer blows required to drive the split spoon in 6-inch increments. The 2-foot

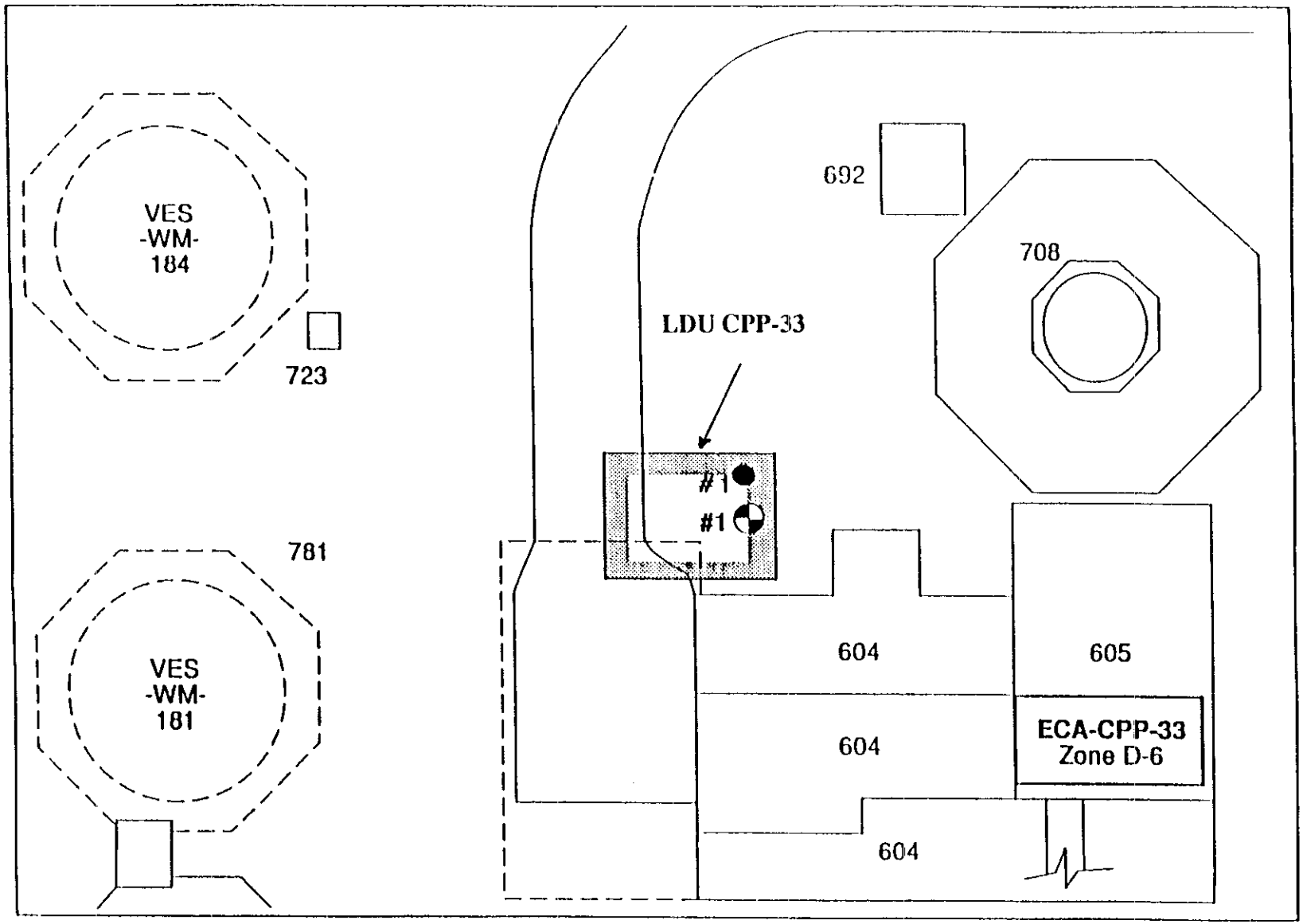


FIGURE 6-1
SAMPLING LOCATION LDU CPP-33
EG&G/ICPP-33/ID

PROJECT NO. 803 1185.850 DRAWING NO. 24889 DATE 4/2/91 DRAWN BY TK

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split-spoon sampler, with the soil sample retained inside, was then removed from the borehole for processing.

Beginning at 14 feet BGL and down to the top of the interbed that overlies the basalt (i.e., 42.5 feet BGL), every other 2-foot (approximate) soil sample was targeted for chemical analysis. These samples were obtained as described above, utilizing a split spoon sampler. The intervening 2-foot sample was recovered with a 5-foot split-barrel sampler (i.e., the lower 2 feet of the barrel retained the sample while the overlying 3 feet was unused), fixed to the auger drill string with the shoe of the sampler extending just beyond the cutting edge of the auger bit. In this way, as the borehole was advanced through the underlying 2 feet, a soil sample was recovered within the split barrel, screened for radiological[1] and/or organic[2] contamination along its entire length, logged, and discarded according to WINCO procedures. If the level of radioactivity detected in the soil sample was greater than 100 cpm above background the soil was considered to be contaminated waste and disposed of under the supervision of a WINCO HP by sealing the waste in yellow packaging and placing it in a white "Hot Box." Otherwise, the soil was discarded in a WINCO-approved, plastic-lined, 55-gallon drum. Due to the proximity of the borehole to the CPP stack, background concentrations, ranged from 200-500 cpm depending on stack effluent conditions. For either method of storage and later disposal (based upon analysis results), the containers were labelled, clearly stating where and when the waste was generated. All instrument readings were recorded in the field log book by the LPG and are included in Table 6-4 of this report.

The silty sand soils encountered at 42.5 feet BGL were sampled continuously in 2-foot lengths, down to the underlying basalt (i.e., 48.2 feet BGL). Aliquots from all of these soil samples were prepared for chemical analysis.

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[1]Screening for radiological contamination during field activities was conducted with a hand-held Ludlum model 61 for alpha and model 2A for beta-gamma radiation.

[2]Screening for organic vapors was conducted with a hand-held Century Organic Vapor Analyzer (OVA) model 128 GC.

Preparations were then made to deepen the borehole, requiring the replacement of the auguring assembly with a drill string, fitted to continuously core the underlying basalt. The auger string was left in the open borehole, down to the alluvium-basalt interface, to assure side-wall stability during the coring process. Because the inner diameter (I.D.) of the augers is 6.5 inches and the outer diameter (O.D.) of the HXB drill string is 3.7, the coring assembly can readily be hoisted to the surface to retrieve the sample. Coring continued through the basalt using HXB series wireline core equipment and a HXB series oversize diamond face-discharged pilot-crown bit (which cuts a 2.40 inch diameter core). A double-barrel coring system was used with a lexan inner barrel. The basalt core was retrieved in 5-foot lengths of lexan inner core tube. The core was then capped in the tubes with soft plastic end caps. Drilling in the basalt was conducted in accordance with GAI Technical Procedure TP-1.2-1, "Rock Core Drilling," and cores were logged by the DPE and LPG in accordance with Technical Procedure TP-1.2-2, "Geotechnical Rock Core Logging." The collected rock cores were turned over to WINCO. All samples were handled in accordance with the chain-of-custody procedures specified in TP-1.2-23.

Samples of the clayey material infilling several fractures in the basalt (which caused above background response on the field detection equipment) were submitted to WINCO for radio-chemical analysis. These samples were obtained by scraping and chipping the clayey material that was deposited along fracture surfaces. A description of these samples may be seen in Table 6-4 and results of analysis are discussed in Section 6.5.4. In addition to the fracture fill material, several split spoon samples were collected from the silty clay interbed below 110.3 feet.

All split-spoon samplers, lexan liners, split barrel samplers, drill rod, core barrel, and associated sampling and coring equipment were decontaminated by GAI personnel. Decontamination as specified in Section 5 of the Technical Work Plan included the following procedures:

- steam clean equipment with deionized water and wipe dry;
- wipe with a towel or rag dampened with methanol and allow to air dry; and
- rinse with deionized water and wipe dry, seal in plastic until needed.

Soil and interbed samples for chemical analysis were obtained by driving a split-spoon sampler as described above. Once removed from the borehole the split-spoon sampler was placed on a clean sheet of plastic on a table inside the exclusion zone. The drilling contractor opened the split-spoon and the LPG removed the lexan liner containing the sample. The lexan tube containing the sample was screened with separate alpha and beta-gamma radiation survey instruments along its entire length and on the open ends prior to sealing the tube. All instrument readings were recorded in the field log book by the LPG. The lexan was then capped with soft plastic end caps and the soils logged by the LPG. Once logged, the sample was handed over the drilling exclusion zone barrier for sample preparation in the sample area exclusion zone.

At the preparation area, the sample was prepared by the sample custodian for shipment to the appropriate laboratory.

Samples were processed by laying out a fresh length of protective plastic on the processing table. The caps on each end of the lexan were then removed and 2 inches of sample material was discarded from the upper and lower end of the lexan tube. Grab samples for volatile organics were immediately poured out of the sampling tube into two 8-ounce amber glass jars. The samples were placed into the jars such that little or no headspace was present. The containers were sealed with teflon-lined lids and then labelled.

The remaining sample material was transferred into a decontaminated stainless steel mixing bowl, mixed thoroughly using decontaminated stainless steel utensils, and any material greater than 3 inches discarded. Aliquots of the remaining material were transferred into two separate 8-ounce or one 16-ounce amber glass jar with teflon-lined lids for analyses as follows: pH and RCRA metals and radionuclides. Field duplicate samples were prepared by placing aliquots in appropriate sample containers and labeling them with unique identification numbers.

After labelling, all samples were screened by a WINCO HP to identify those samples with above-background radiation levels. Radioactive samples were separated from non-radioactive samples and placed in designated U.S. Department of Transportation

(DOT) cartons. All samples were held in shipping containers (the radioactive and non-radioactive samples in separate containers) with the necessary amount of coolant for maintaining the samples at 4°C.

All solid wastes generated by the sampling activities for each day were double-packaged according to WINCO waste handling practices and removed from the site for disposal in accordance with INEL waste disposal procedures. Solid wastes suspected of radiological contamination were doubled-bagged and sealed in yellow packaging with the standard magenta radiation symbol. The packaging was labelled showing date, radiation level and site prior to being placed in the white "Hot Boxes." All liquid wastes generated from the final decontamination of sampling equipment were collected in a catch basin and pumped into 55-gallon drums for disposal.

At the end of the sampling activities for each day, non-radioactive samples were double-checked for proper labeling, securely wrapped in bubble pack, and packaged in a cooler with additional blue ice. A chain-of-custody form and security seal was then placed on the cooler. The cooler was transported to Idaho Falls and relinquished to Federal Express to be shipped under chain-of-custody to the appropriate laboratory by overnight service. Due to the more lengthy packaging, labelling, and documentation process associated with shipping radioactive material, radioactive samples were typically stored overnight in a sample shed with security seals applied to the shed door. The following morning, the GAI DPE or LPG and WINCO HP would escort the samples to the Vehicle Monitoring Facility (VMF) shipping department where the samples were surrendered under chain-of-custody to WINCO personnel. The samples were then couried to the appropriate laboratory by overnight service.

6.2 Background Data

Background data for metal concentrations in soils at the ICPP were obtained by the University of Utah Research Institute (UURI) during two studies conducted in 1986 and 1987. Background soils data were obtained at four locations outside the ICPP during an investigation of the Fuel Processing Restoration (FPR) Warehouse Site in 1986. According to the Quality Assurance Sampling Plan (QASP) for this study,

background subsurface soils collected were to be geologically identical to soils in the FPR site sampling area. The QASP indicated the FPR site soils were to be sampled at depths of 6 inches below the pre-fill surface of the area and at 18 to 24 inches below the top of the first horizon samples. The actual depth interval sampled for background soils is not noted in the QASP or the final report of the investigation (UURI, 1986a and UURI, 1986b).

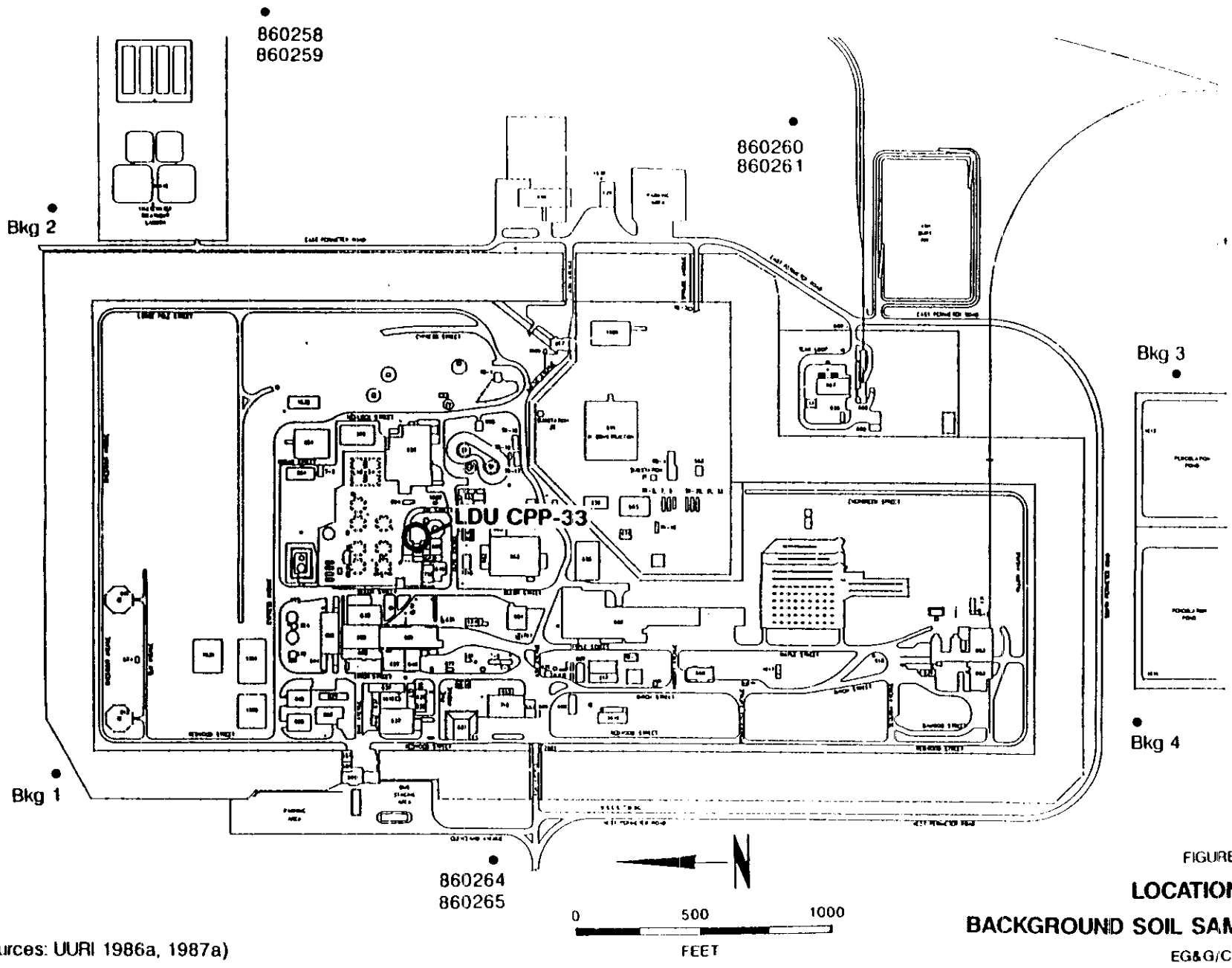
In 1987, background data were obtained at three locations outside the ICPP during an investigation of the Chemical Feed and Zirconium Feed Tank Storage Areas. Samples were obtained at surface to 4 inches and at 24 inches at these locations for a total of six samples (UURI, 1987a and UURI, 1987b).

Locations of background samples from the two studies discussed above are shown in Figure 6-2.

6.2.1 Data Quality Assurance/Quality Control

The precision and accuracy of existing background soils data are discussed in the UURI reports (UURI, 1986b and 1987b), and the data quality objectives established for the sampling are reported to have been met. In general, the quality of the data appears to be sufficient to permit its incorporation into a general ICPP background data base. However the data cannot be completely evaluated. The reports state that appropriate QA/QC was conducted and that records are maintained at the analytical laboratories. Assuming that this evaluation is correct, observations on data quality are summarized below:

- Background soil samples were collected in accordance with standard hand auguring techniques. Laboratory analysis was conducted in accordance with approved EPA methods. These data should be comparable to data collected elsewhere by similar techniques and analyzed by the same EPA methods.



(Sources: UURI 1986a, 1987a)

FIGURE **6-2**

LOCATIONS OF BACKGROUND SOIL SAMPLES

EG&G/CPP-33/ID

PROJECT NO 893-1195.850 DWG NO 23671 DATE 4/11/91 DRAWN HP

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- Based on the information provided in the UURI reports, the precision and accuracy of the laboratory analysis was within the established control limits and was acceptable for the purposes of the original studies.

- The detection limits reported for the analyses are generally higher than can commonly be achieved with standard EPA analytical methods and may not have provided data that are sufficiently precise to satisfy all potential uses.

- Some difficulty was reported for the lead analyses in the warehouse site study (UURI, 1986b), but not in the storage areas study (UURI, 1987b). It is interesting to note that lead was detected in all the background samples collected during the warehouse site study, but was below detection limit in all background samples collected during the storage areas study.

- There was an apparent outlier in the background fluoride data that was not discussed in the UURI, report (UURI, 1987b). The concentration detected in Sample 860264 was 4.0 ppm, while the range of values for all other background samples was 0.12 to 0.42 ppm.

- With the possible exceptions of lead and fluoride, the background inorganic data appears to be adequate for representing the upper 2 feet of soils unimpacted by ICPP activities.

6.2.2 Chemical Parameters

Table 6-1 presents the background data for inorganic constituents obtained during the two investigations conducted by UURI. Both investigations included testing for the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, silver and selenium). In addition, background data for nitrate, fluoride, aluminum, and zirconium was obtained during the

investigation of the Chemical Feed Storage and Zirconium Feed Tank Storage Areas.

Analyses were also conducted for volatile organic compounds (EPA Method 8240) and semi-volatile organic compounds (EPA Method 8270) on the four background samples collected during the FPR Warehouse Site investigation (UURI, 1986b). No organic compounds were detected. However, the reported detection limits for the organic compounds (1 to 10 ppm) were higher than commonly achievable (5 to 500 ppb) using the methods referenced. These high detection limits would have the effect of screening out compounds present at low concentrations.

6.2.3 Number of Samples

The number of samples available from existing background data for each of the types of parameters is presented below (see Table 1):

- Volatile Organic Compounds - 4
- Semi-volatile Organic Compounds - 4
- RCRA Metals - 10
- Other (nitrate, fluoride, aluminum, and zirconium) - 6

6.3 QA/QC For LDU CPP-33 Sampling

QA/QC procedures were implemented during the sampling and analysis program at LDU CPP-33. These procedures are summarized below:

- Seven field blank samples (six trip blanks and one equipment blank) were collected and analyzed to monitor potential contamination that may have been introduced from the decontamination procedures and shipping process.

TABLE 6-1

BACKGROUND CONCENTRATIONS OF METALS AND FLUORIDE
IN SOILS SAMPLED FROM OUTSIDE THE ICPP FACILITY AND
ONE-SIDED NORMAL TOLERANCE INTERVALS(1)

Results in PPM									
Sample	Arsenic	Barium	Cadmium	Chromium	Lead (2)	Mercury	Selenium	Silver	Fluoride
Bkg 1	5.6	200	<5	25	12	0.043	0.484	<2	
Bkg 2	5.1	270	<5	32	16	0.019	0.405	<2	
Bkg 3	6.5	270	<5	33	17	0.027	0.467	<2	
Bkg 4	7	250	<5	34	12	0.028	0.341	<2	
258	5.6	280	<5	28	<10	0.025	0.113	<2	0.15
259	7.6	380	<5	26	<10	0.057	0.252	<2	0.32
260	6.4	240	<5	28	<10	0.023	0.695	<2	0.12
261	6.2	220	<5	18	<10	0.03	0.236	<2	0.42
264	6	230	<5	28	<10	0.021	0.102	<2	4.00
265	7.6	210	<5	20	<10	0.046	0.227	<2	0.28
Average (x)	6.4	255	<5	27	9	0.032	0.332	<2	0.88
Std. Dev. (SD)	0.8	51	--	5	5	0.013	0.184	--	1.53
Background UTL (3)	8.7	403	--	42	24	0.070	0.868	--	6.55

1. All samples were collected by the University of Utah Research Institute, Salt Lake City, UT using EPA methods. Samples Bkg 1-4 were collected for the FPR Warehouse Site, and 258-265 were collected for the Chemical Storage and Zirconium Feed Tank Storage Areas. All analyses are total constituent analyses and are reported on a dry weight basis.

2. Where lead values are listed below detection limit a value of one-half the detection limit was used in the calculation of the average, standard deviation and tolerance limit values.

3. The background one-sided upper tolerance interval (UTL) is (x) + K*SD, where the K value (tolerance factor) for sample size n = 10 is equal to 2.911 with a probability level y = 0.95 and coverage P = 95%

- A field duplicate sample was collected to measure overall precision (i.e., field and laboratory).

Quality control samples represented 31 percent of the total number of samples collected.

6.3.1 Blanks

Trip blanks were included in each sample shipment container in which volatile organic samples were shipped as a means of detecting the introduction of contaminants to the samples through sample handling, storage, preparation and analysis. The equipment blank sample was submitted as a means of detecting the introduction of contamination to the samples from inadequate equipment decontamination or from sample handling and preparation procedures. The equipment blank was prepared by decontaminating the sample processing equipment as described in Section 9 of the Technical Work Plan, Volume II (GAI, 1991b), followed by a final rinse with deionized water and collected in proper containers. Laboratory method blanks were prepared and analyzed with the samples as a means of detecting the introduction of contaminants into the samples as a result of laboratory procedures. As recommended by the EPA (EPA, 1988a and EPA, 1988b), sample results that are less than or equal to 5 times (10 times for the common laboratory contaminants) the concentration of the compound or analyte in an associated blank are qualified as undetected (U) at the reported concentration during data validation.

6.3.1.1 Volatile Organic Analysis Blanks

Trip blanks were submitted for volatile organic analysis in all sample shuttles. Methylene chloride was detected in three of the six trip blanks (0.5 to 1 ug/L) submitted as well five of the seven laboratory blanks (0.7 to 3 ug/L). The presence of methylene chloride in the laboratory blanks suggests the source of the compound is most likely the laboratory. All sample results were less than 10 times the

concentration in the laboratory blanks; therefore, the sample results were requalified as undetected (U) at the concentration reported.

Acetone was detected in all samples analyzed including all six trip blanks (ranging from 4 to 11 ug/L), the equipment blank (48 ug/L), and all seven laboratory blanks (5 to 7 ug/L). The presence of acetone in the laboratory blanks points to the laboratory as the source of the acetone. All sample results were less than 10 times the concentration in the laboratory, trip, or equipment blanks; therefore, the sample results were requalified as undetected (U) at the concentration reported.

2-butanone was detected in the equipment blank at 7 ug/L. Because 2-butanone is a common laboratory contaminant and is not used in the decontamination procedures, the contaminant was most likely introduced to the sample during the laboratory sample processing. 2-butanone was not detected in any other samples.

Four Tentatively Identified Compounds (TICs) were reported for most samples and blanks. Because the TICs were detected in the method blanks, these compounds were most likely introduced into the samples in the laboratory. All sample results were less than 5 times the concentration found in the method blanks; therefore, the sample results were requalified as undetected at the concentration reported.

6.3.1.2 Metals Analysis Blanks

The equipment blank sample was submitted for metals analyses. Lead was the only analyte detected above the instrument detection limit in the equipment blank. All sample concentrations of lead were greater than 5 times the concentration found in the equipment blank, therefore, qualification of the sample results due to blank contamination was not required.

6.3.1.3 Radionuclide Analysis Blanks

The equipment blank sample was submitted for radionuclide analysis. Strontium-90 was detected in the equipment lank at a concentration of 3.0 ±2.1 pCi/L. All sample concentrations of strontium-90 above the detection limit were greater than 5 times the concentration found in the equipment blank, therefore, qualification of the sample results due to blank contamination was not required.

6.3.2 Field Duplicate Sample

The field duplicate sample analysis results from CPP-33 Site 1 (Borehole 1) are presented in Table C-1 (Appendix C). The sample was collected and prepared as described in Section 6.1 and submitted for volatile organic, pH, and RCRA metals analysis. The table presents the relative percent difference (RPD, as defined in EPA 1988b) between duplicate samples for analyses that exhibit concentrations greater than the sample detection limit. Although no criterion has been established for field duplicates, the EPA advises that the RPD fall within a range of ±20 percent for water samples and ±35 percent for soils when sample values are greater than five times the sample detection limit. All field duplicate results were within the advisory control limit range except for cesium-137.

6.3.3 Field Split Samples

Collection of field split samples was not scheduled for this sampling event. However, due to miscommunication with the laboratory, samples numbered CPP33-01-TX-1-1, CPP33-01-TX-3-2, CPP-33-01-R-1-1 and CPP33-01-R-3-2 were analyzed as split samples. (Two sample containers of each sample were submitted to ensure sufficient sample, but the laboratory analyzed each container as a separate sample.) Sample results for the inorganic analysis are included in Table C-2 (Appendix C) with the calculated Relative Percent Difference (RPD). Radionuclide analysis results for field split samples have not been included as all radionuclides were below detection. No criterion

has been established for field split samples, although advisory control limits of +20 for water samples and ±35% for soils is often used. Analysis data is not qualified on the basis of field split samples.

6.4 Data Validation

All samples were analyzed following CLP protocols (EPA, 1988c and EPA, 1988d). Sample analysis results were reviewed and validated in accordance with Section 8 of the Technical Work Plan, Volume II - quality Assurance Project Plan (GAI, 1991b) and with the EPA data validation guidelines (EPA, 1988a and EPA, 1988b). Data assessment summaries are included in the appendices with the laboratory submitted Form I's.

Holding times for soil samples have not yet been established, however, all soil samples were analyzed within the recognized advisory holding times specific to the extraction or analyses (i.e., 14 days for volatile organics, 28 days for mercury, etc.).

Trichloroethene was the only volatile organcic compound detected in the soil samples that was not requalifed as undetected due to blank contamination. Trichloroethene was detected in only one sample (collected at the seven foot interval), however, the concentration was below the contract required quantitation limit and therefore the sample result is qualified as estimated, "J".

Because the laboratory did not have access to a solid matrix laboratory control sample (LCS), all metals analysis results were qualified as estimates (J or UJ).

6.5 Data Evaluation

6.5.1 Background Data

The background data obtained from the UURI investigations is compared with CPP-33 results in Table 6-2. This table includes the one-sided upper tolerance limit (UTL) for the background data assuming a normal distribution with 95 percent coverage of the samples at a 95 percent confidence

coefficient. Tolerance limits establish a concentration range that is constructed to contain a specified proportion of coverage, P%, of the population with a specified confidence coefficient, Y (EPA, 1989a).

There are potential limitations that should be considered in the use of the data obtained by UURI for determining action levels based on background concentrations. These limitations include the following:

- All UURI background data were obtained in the shallow surface soils (0 to 24 inches) and may not be representative of other soil types or horizons;

- LDU CPP-33 has been excavated and filled; consequently, background soils sampled by UURI may not be representative of soils used for fill at the LDU CPP-33; and

- There may be widespread elevated concentrations of certain constituents above natural background at the ICPP from both point and non-point sources as a result of site activities. It is not appropriate to establish action levels for LDUs based on natural background if there are widespread elevated concentrations of constituents at the ICPP unrelated to releases from the LDUs.

TABLE 6-2

INORGANIC SAMPLE ANALYSIS RESULTS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1
(Results in mg/Kg, except pH in SU)

Depth (ft)	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	pH
1	3.7 J	74.8 J	3.8 J	16.4 J	9.6 J	1.51 J	1.0 UJ	0.83 J	10.20
3	3.2 J	81.5 J	3.9 J	16.8 J	10.6 J	0.27 J	1.0 UJ	0.73 J	10.10
5	3.0 J	58.1 J	2.7 J	11.3 J	7.4 J	0.08 J	1.1 UJ	0.63 J	10.20
7	2.8 J	66.1 J	3.2 J	13.4 J	9.7 JJ	0.16 J	1.1 UJ	0.54 J	9.54
9	4.7 J	75.8 J	4.1 J	15.6 J	11.7 J	0.12 J	1.1 UJ	0.54 J	11.50
11	3.3 J	61.1 J	3.3 J	11.9 J	8.7 J	0.24 J	1.1 UJ	0.53 J	9.40
17	4.1 J	81.9 J	4.8 J	15.7 J	12.0 J	0.09 J	1.0 UJ	0.52 J	9.47
21	4.6 J	82.7 J	5.1 J	17.7 J	11.4 J	0.14 J	1.1 UJ	0.54 J	9.09
25	3.9 J	88.8 J	5.0 J	16.3 J	12.2 J	0.12 J	1.1 UJ	0.53 J	9.30
29	4.3 J	91.0 J	4.6 J	15.8 J	12.2 J	0.19 J	1.1 UJ	0.65 J	9.36
33	4.3 J	57.6 J	2.7 J	10.1 J	6.9 J	0.15 J	1.1 UJ	0.54 J	9.41
37	5.5 J	61.1 J	4.6 J	13.3 J	9.6 J	0.17 J	1.1 UJ	0.64 J	9.58
39	5.5 J	144.0 J	8.2 J	31.8 J	19.5 J	0.12 J	1.2 UJ	0.72 J	9.38
41	4.8 J	158.0 J	9.4 J	36.9 J	22.8 J	0.26 J	1.1 UJ	1.15 J	8.87
45	4.9 J	193.0 J	11.1 J	40.0 J	25.5 J	0.13 J	1.2 UJ	0.71 J	9.30
47	4.2 J	178.0 J	9.1 J	34.1 J	21.1 J	0.05 J	1.2 UJ	0.59 J	9.08
112	5.9 J	193.0 J	11.2 J	34.0 J	31.7 J	0.03 J	0.51 J	0.92 J	9.53
113	6.8 J	191.0 J	11.1 J	37.0 J	30.5 J	0.02 J	0.78 J	0.92 J	9.73
CRQL	2.0	40.0	1.0	2.0	1.0	0.10	1.0	2.0	NA
Background UTL	8.7	403.0	5.0	42.0	24.0	0.07	0.9	2.0	NA

CRQL - Contract Required Quantitation Limit
U - Analyte was undetected at the concentration reported

TABLE 6-3

DETECTED ORGANIC COMPOUNDS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1
(Results in μg/kg)

SAMPLE NO.	TRICHLOROETHENE
CPP33-01-7-4	1 J

TABLE 6-4

RESULTS OF FIELD SCREENING BY WINCO HP AT BOREHOLE CPP-33-1

Depth Below Ground Level (feet)	Radiation Surveyed from Soils/Core Removed from Borehole (cpm)	Media
0.0 - 2.0	Background[1]	Alluvium
2.0 - 4.0	Background[1]	Alluvium
4.0 - 6.0	Background[1]	Alluvium
6.0 - 8.0	1,800	Alluvium
8.0 - 10.0	2,400	Alluvium
10.0 - 12.0	2,000	Alluvium
16.0 - 18.0	10,000	Alluvium
20.0 - 22.0	4,000	Alluvium
24.-0 - 26.0	4,000	Alluvium
28.0 - 30.0	2,500	Alluvium
32.0 - 34.0	Background[1]	Alluvium
36.0 - 38.0	6,000	Alluvium
38.0 - 40.0	Background[1]	Alluvium
40.0 - 42.0	Background[1]	Alluvium
44.0 - 46.0	Background[1]	Alluvium
46.5 - 47.8	Background[1]	Alluvium
48.2 - 52.6	Background[1]	Clayey fracture infill[2]
52.6 - 57.6	Background[1]	Clayey fracture infill[2]
57.6 - 62.7	Background[1]	Basalt[3]

NOTE: All readings are maximum values. WINCO HPs surveyed soils and cores with a Ludlum beta/gamma detector.

cpm = counts-per-minute

[1] Ambient background radioactivity in the vicinity of CPP-33 ranged from 200 to 500 cpm.
[2] The measurement was taken along clayey material lining surfaces in basalt.
[3] Fractures in basalt were not clay lined.

TABLE 6-4 (Continued)

RESULTS OF FIELD SCREENING BY WINCO HP AT BOREHOLE CPP-33-1

Depth Below Ground Level (feet)	Radiation Surveyed from Soils/Core Removed from Borehole (cpm)	Media
62.7 - 67.7	Background[1]	Clayey fracture infill[2]
67.7 - 72.7	Background[1]	Basalt[3]
72.7 - 74.0	1,000	Clayey fracture infill[2]
74.0 - 74.9	900	Clayey fracture infill[2]
74.9 - 79.0	10,000	Clayey fracture infill[2]
79.0 - 84.0	20,000	Clayey fracture infill[2]
84.0 - 89.0	40,000	Clayey fracture infill[2]
89.0 - 91.0	32,000	Clayey fracture infill[2]
91.0 - 94.0	10,000	Clayey fracture infill[2]
95.0 - 99.0	15,000	Clayey fracture infill[2]
99.0 - 102.4	16,000	Clayey fracture infill[2]
102.4 - 107.2	Background[1]	Clayey fracture infill[2]
107.2 - 110.3	Background[1]	Interbed
110.3 - 112.3	Background[1]	Interbed
112.3 - 113.6	Background[1]	Interbed

NOTE: All readings are maximum values. WINCO HPs surveyed soils and cores with a Ludlum beta/gamma detector.

cpm = counts-per-minute

[1] Ambient background radioactivity in the vicinity of CPP-33 ranged from 200 to 500 cpm.
[2] The measurement was taken along clayey material lining surfaces in basalt.
[3] Fractures in basalt were not clay lined.

6.5.2 Results of RCRA Metals and pH Analysis for LDU CPP-33

Sample results for the Inorganic Analysis, as reported by the laboratory, are included in Appendix E.

Validated sample results for the RCRA metals are shown in Table 6-2. Also shown on this table is the upper tolerance limit (UTL) for each analyte for the background soils described in Section 6.2. Cadmium, lead and mercury were the only metals found exceeding the background UTL.

Cadmium was detected above the background UTL in the five deepest samples: 41 feet, 8.2 mg/Kg; 45 feet, 9.3 mg/Kg. Lead was detected above the background UTL in one sample (24.1 mg/Kg) at 112-foot depth. However, as noted previously, existing background data may not be representative at these depths. Mercury was detected above the background UTL in all samples except the three depest. Mercury was detected at 1.45 mg/Kg in the sample collected at the 1-foot depth, but all other samples for which mercury ws above the background UTL were 0.26 mg/Kg or less.

6.5.3 Result of Organic Analysis for LDU CPP-33

Sample results for the Volatile Organic Analysis, as reported by the laboratory, are included in Appendix F.

The only positively identified organic constituent detected in the validated organic results was trichloroethene. Trichloroethene was detected in the sample collected at the 7-foot depth only, and at a level (1 ug/Kg) below the contract required quantitation limit for soils (5 ug/Kg). Therefore, only an estimated (J) concentration appears in Table 6-3.

6.5.4 Results of Radionuclide Analysis

Validated sample results for the radionuclide analysis are presented in Table 6-5. Laboratory reported results are included in Appendix E, following the Inorganic Analysis Data Sheets. Results of field screening are presented in Table 6-4.

As seen in Table 6-5 americium, cesium, neptunium, plutonium, strontium, and uranium were detected in the samples submitted for radiochemical analysis. Americium-241 was detected in the samples submitted for activity of 9.59 pCi/g down to a depth of 11 feet BGL an is not detected again until the 45-foot sample (0.39 pCi/g). Neptunium-237 is first detected at a depth of 37 feet BGL (1.14 pCi/g), then at the 41-foot depth (0.68 pCi/g) and again in the 112-foot sample (0.38 pCi/g). It was not detected in the lowermost 113-foot sample. Plutonium-239 and -240 were only detected in the surficial sample (0.34 pCi/g). Plutonium-238 was seen to persist down to a depth of 11 feet below surface. (A maximum concentration of 0.46 pCi/g was reported). Although detected at low levels of activity, uranium-234 and -238 was present in all but one of the borehole samples submitted for anlaysis. The range in activity values for uranium-234 was from 0.09 to 0.51 pCi/g, with the maximum value detected at a depth of 47 feet BGL. An activity of 0.07 pCi/g was detected in the 113-foot sample. The pattern of occurrence of uranium-238 was seen to be very similar to that of uranium-234. The concentrations detected for a given sample generally differed by a few hundredths pCi/g.

Cesium-137 and strontium-90 were detected at levels significantly higher than the other targeted radionuclides (see Table 6-5). Within the alluvial material, the pattern of occurrence of these two radionuclides is similar with depth. Relatively low levels of strontium and cesium (non-detect to less than 3 pCi/g) were detected fromt he surface down to a depth of approximately 5 feet. Concentrations increase with depth and a maximum value for strontium and cesium ws detected at depths of 17 feet (328,8 $\pm$ 1.8 pCi/g) and 25 feet (606 $\pm$ 3 pCi/g), respectively. Concentrations of both

radionuclides fall off rapidly at depths greather than 37 feet BGL. At the sediment-basalt interface (approximtely 47 feet BGL), strontium-90 was not detected at the Sample Quantitation Limit (SQL); however, cesium-137 ws detected at an activity level of 2.13 $\pm$ 0.07 pCi/g.

Cesium is strongly partitioned to the solid phase. This characteristic is expressed by the distribution coefficient, K_d, which is the ratio of the mass of solute sorbed by the solid pahse (mg/Kg) to the mass of solute dissolved in water (mg/L), under assumptions of equilibrium. The distribution coefficient for cesium-137 is estimated to be 20 to 60 times higher than that of strontium-90 in the same system (Robertson, 1977). A K_d for strontium-90 equal to 60 was obtained by measuring the concentration of strontium-90 present in water and soil samples from a borehole and well in the vicinity of the ICPP. The results of laboratory batch tests show the K_d for strontium-90 to vary from 45 to 50 (Thomas, telcon, February, 1991). Therefore, cesium-137 migration is very slow and much slower and generally at lower concentrations than strontium-90.

It must be emphasized, however, because the contaminated soils encountered during the excavations of 1974 and 1983 have been removed and replaced by fill material, ther exist a number of scenarios which can account for the pattern of radionuclides detected beneath LDU CPP-33.

TABLE 6-5

RADIONUCLIDE SAMPLE RESULTS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1
(Results in pCi/g)

SAMPLE NO. CPP33-01-	DEPTH (FT)	AMERICIUM -241	ANTIMONY -125	CERIUM -144	CESIUM -134	CESIUM -137	COBALT -58
R-1-1	1	2.04 ± 0.87	0.03 U	0.05 U	0.08 U	0.03 U	0.09 U
R-3-2	3	0.05 U	0.03 U	0.05 U	0.08 U	0.40 U	0.09 U
TX/R-5-3	5	2.91 ± 2.02	0.03 U	0.05 U	0.08 U	0.40 U	0.09 U
TX/R-7-4	7	0.05 U	0.03 U	0.05 U	0.08 U	306 ± 4	0.09 U
TX/R-9-5	9	0.05 U	0.03 U	0.05 U	0.08 U	254 ± 3	0.09 U
TX/R-11-6	11	9.59 ± 1.59	0.03 U	0.05 U	0.08 U	53.0 ± 1.8	0.09 U
TX/R-17-7	17	0.05 U	0.03 U	0.05 U	0.08 U	219 ± 3	0.09 U
TX/R-21-8	21	0.05 U	0.03 U	0.05 U	0.08 U	416 ± 4	0.09 U
TX/R-25-9	25	0.05 U	0.03 U	0.05 U	0.08 U	606 ± 3	0.09 U
TX/R-29-10	29	0.05 U	0.03 U	0.05 U	0.08 U	298 ± 2	0.09 U
TX/R-33-11	33	0.05 U	0.03 U	0.05 U	0.08 U	10.3 ± 0.4	0.09 U
TX/R-37-12	37	0.05 U	0.03 U	0.05 U	0.08 U	121 ± 1	0.09 U
TX/R-39-13	39	0.05 U	0.03 U	0.05 U	0.08 U	0.42 ± 0.07	0.09 U
TX/R-41-14	41	0.05 U	0.03 U	0.05 U	0.08 U	0.12 ± 0.07	0.09 U
TX/R-45-15	45	0.39 ± 0.24	0.03 U	0.05 U	0.08 U	2.37 ± 0.15	0.09 U
TX/R-47-16	47	0.05 U	0.03 U	0.05 U	0.08 U	2.13 ± 0.07	0.09 U
112	112	0.05 U	0.03 U	0.05 U	0.08 U	0.04 U	0.09 U
113	113	0.05 U	0.03 U	0.05 U	0.08 U	0.08 U	0.09 U

U - Radionuclide undetected at the reported concentration.

TABLE 6-5 (Cont.)

RADIONUCLIDE SAMPLE RESULTS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1
(Results in pCi/g)

SAMPLE NO. CPP33-01-	DEPTH (FT)	COBALT -60	IODINE -129	NEPTUNIUM -237	PLUTONIUM -239/240	PLUTONIUM -238	RUTHENIUM -103
1-1	1	0.07 U	0.5 U	0.4 U	0.34 ± 0.12	0.46 ± 0.14	0.2 U
3-2	3	0.07 U	0.5 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-5-3	5	0.07 U	0.5 U	0.5 U	0.05 U	0.06 ± 0.04	0.2 U
TX/R-7-4	7	0.07 U	0.5 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-9-5	9	0.07 U	0.5 U	0.5 U	0.05 U	0.08 ± 0.05	0.2 U
TX/R-11-6	11	0.07 U	0.5 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-17-7	17	0.07 U	0.5 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-21-8	21	0.07 U	0.5 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-25-9	25	0.07 U	0.8 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-29-10	29	0.07 U	0.7 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-33-11	33	0.07 U	0.8 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-37-12	37	0.07 U	0.2 U	1.14 ± 0.60	0.05 U	0.05 U	0.2 U
TX/R-39-13	39	0.07 U	0.3 U	0.5 U	0.05 U	0.05 U	0.2 U
TX/R-41-14	41	0.07 U	0.8 U	0.68 ± 0.27	0.05 U	0.05 U	0.2 U
TX/R-45-15	45	0.07 U	0.9 U	0.6 U	0.05 U	0.05 U	0.2 U
TX/R-47-16	47	0.07 U	0.3 U	0.3 U	0.05 U	0.05 U	0.2 U
112	112	0.07 U	0.1 U	0.38 ± 0.17	0.05 U	0.05 U	0.2 U
113	113	0.07 U	0.1 U	0.4 U	0.05 U	0.05 U	0.2 U

U - Radionuclide undetected at the reported concentration.

TABLE 6-5 (Cont.)

RADIONUCLIDE SAMPLE RESULTS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1
(Results in pCi/g)

SAMPLE NO. CPP33-01-	DEPTH (FT)	RUTHENIUM -106	STRONTIUM -90	URANIUM -234	URANIUM -235	URANIUM -238
1-1	1	0.07 U	2.87 ± 0.20	0.09 ± 0.02	0.05 U	0.09 ± 0.03
3-2	3	0.07 U	0.35 ± 0.10	0.15 ± 0.05	0.05 U	0.13 ± 0.04
TX/R-5-3	5	0.07 U	1.63 ± 0.15	0.10 ± 0.02	0.05 U	0.10 ± 0.02
TX/R-7-4	7	0.07 U	102.0 ± 1.1	0.12 ± 0.03	0.05 U	0.09 ± 0.03
TX/R-9-5	9	0.07 U	281.7 ± 1.8	0.12 ± 0.03	0.05 U	0.09 ± 0.02
TX/R-11-6	11	0.07 U	47.68 ± 0.74	0.08 ± 0.03	0.05 U	0.08 ± 0.03
TX/R-17-7	17	0.07 U	328.8 ± 1.8	0.10 ± 0.03	0.05 U	0.13 ± 0.04
TX/R-21-8	21	0.07 U	294.7 ± 1.7	0.16 ± 0.04	0.05 U	0.10 ± 0.03
TX/R-25-9	25	0.07 U	163.5 ± 1.3	0.13 ± 0.02	0.05 U	0.11 ± 0.02
TX/R-29-10	29	0.07 U	108.4 ± 1.1	0.12 ± 0.04	0.05 U	0.13 ± 0.04
TX/R-33-11	33	0.07 U	6.0 ± 0.3	0.18 ± 0.04	0.05 U	0.26 ± 0.04
TX/R-37-12	37	0.07 U	47.9 ± 0.7	0.05 U	0.05 U	0.05 U
TX/R-39-13	39	0.07 U	0.87 ± 0.12	0.28 ± 0.09	0.05 U	0.30 ± 0.09
TX/R-41-14	41	0.07 U	0.39 ± 0.11	0.32 ± 0.04	0.05 U	0.54 ± 0.05
TX/R-45-15	45	0.07 U	2.5 ± 0.2	0.17 ± 0.03	0.05 U	0.18 ± 0.04
TX/R-47-16	47	0.07 U	0.10 U	0.51 ± 0.19	0.05 U	0.53 ± 0.20
112	112	0.07 U	0.16 ± 0.08	0.07 ± 0.01	0.05 U	0.05 ± 0.01
113	113	0.07 U	0.18 ± 0.08	0.20 ± 0.02	0.05 U	0.19 ± 0.02

U - Radionuclide undetected at the reported concentration.

7.0 CLOSURE PROCEDURES

Remediation of CPP-33 is to be based on the presence of hazardous waste or concentrations of hazardous constituents and the level of risk posed to human health and safety or the environment. The action level requiring RCRA closure of LDU CPP-33 is to be based on the pH of the soils and/or the presence of metals or organics above the TCLP limits. The action level associated with pH is less than or equal to 2 or greater than or equal to 12.5. Additional action levels of other hazardous constituents is to be based on an unacceptable risk to human health and safety.

Though several inorganic constituents were detected above background levels, none were found exceeding the maximum allowable soil concentrations based on the Chronic Reference Dose (see Table G-2). The Chronic Reference Dose is the daily intake of the constituent at which even a sensitive individual might be exposed without developing associated critical toxic effects. Furthermore, none of the constituents exceeded the allowable soil concentrations proposed in the Corrective Action for Solid Waste Management Facilities (Fed. Reg. Vol. 55, No. 145 30798-30884). The pH analytical results from the borehole soil samples were all below the pH-based action levels.

The Health and Environmental Assessment of CPP-33 (Golder Associates, 1991d) is contained in Appendix G.

Although radionuclides are not governed by RCRA, radiological analyses and a health and environmental assessment were performed to determine if the radiological contamination present at the unit posed a risk to human health, safety, or the environment. The radionuclides detected do not pose an unacceptable risk. The upcoming FFA/CO may require additional characterization, risk assessment and remediation.

Since RCRA hazardous wastes/constituents were detected at levels below those that would pose a threat to human health and safety or the environment, no

basis exists for remediation or post-closure of this site in accordance with RCRA. Therefore, LDU CPP-33 should be clean closed under RCRA.

8.0 POST-REMOVAL SAMPLING AND ANALYTICAL PROCEDURES

Since LDU CPP-33 will be clean closed, post-removal verification will not be conducted under RCRA. Post-removal verification will be addressed under the upcoming INEL Federal Facilities Agreement if site remediation is required.

Post-removal sampling and chemical analysis would be conducted consistent with the protocol and procedures in the Technical Work Plan and Quality Assurance Project Plan for CPP-33 (GAI 1991a and 1991b). If additional soil in the vicinity of the LDU CPP-33 is removed at a later date, in accordance with the FFA/CO, post-removal sampling and analysis will be conducted at that time.

9.0 CLOSURE QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

All sampling and analysis activities were performed in accordance with sound QA/QC procedures. These procedures are outlined in the QAPP for drilling and Sampling Activities at the ICPP Tank Farm (Golder Associates 1991a). The plan incorporates all applicable requirements of ANSI/ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities, which is defined as the preferred standard for all projects conducted at nuclear facilities by U.S. Department of Energy (DOE) Order 5700.6B, Quality Assurance. In addition, the QAPP was written in compliance with the guidelines provided by Interim Guidelines for Preparation of Quality Assurance Project Plans (QAMS/005). Interpretations of QAMS/005 and expanded guidance provided by other applicable EPA guidance documents were considered during the preparation of the QAPP.

10.0 CLOSURE CERTIFICATION

If LDU CPP-33 is clean closed and no soil is removed, a closure certification will not be required. If remediation is required, under the FFA/CO this Closure Plan and all associated activities will be reviewed by a registered engineer. Upon completion, a certification will be obtained stating that all work was performed in accordance with the closure plan.

11.0 AREA RESTORATION

Since no remedial activities will be conducted under RCRA, area restoration will not be required. Area restoration will be addressed under the upcoming INEL Federal Facilities Agreement if site remediation is required.

12.0 OTHER TOPICS OF CONCERN

None at this time.

13.0 POST-CLOSURE CARE

Since the unit is being clean closed, post-closure requirements under RCRA (40 CFR 265.117 - 120) and the COCA will not be required.

Additionally, monitoring to support characterization of the Tank Farm will be conducted. The lysimeter and monitoring well, installed at LDU CPP-33 (their location is shown in Figure 6-1, and construction details are shown in Appendix A), will provide water samples allowing surveillance of dissolved constituents.

14.0 REFERENCES

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APPENDIX A

BOREHOLE LOG

STRATIGRAPHY

Depth in Feet

Graphic Log | Sample/Core Recovery (%) | RQD(%)

0

1.0
Dense, dark yellowish-brown (10YR 4/2), GRAVEL, some fine to medium sand, little cobbles, damp. (SW-GW) FILL.

2.0
Compact, dark yellowish-brown (10YR 4/2), SAND and GRAVEL, trace cobbles, trace to a little silt, damp. (SW-GW) FILL.

5

Moist below 6.0 feet.

Little silt below 8.0 feet.

10

Moist to wet 10.0 to 12.0 feet.
Olive-gray to dark olive-gray below 12 feet.
Some silt below 12 feet.

15

14.0-16.0: Driller augered through interval

Wet 16.0 to 18.0 feet.

18.0-20.0: Driller augered through interval

20.0
Compact, olive gray (5Y 4/2), fine to coarse SAND, some gravel, some to trace silt, moist (SM). FILL.

20

22.0-24.0: Driller augered through interval

25

26.0-28.0: Driller augered through interval

Dense below 28.0 feet.

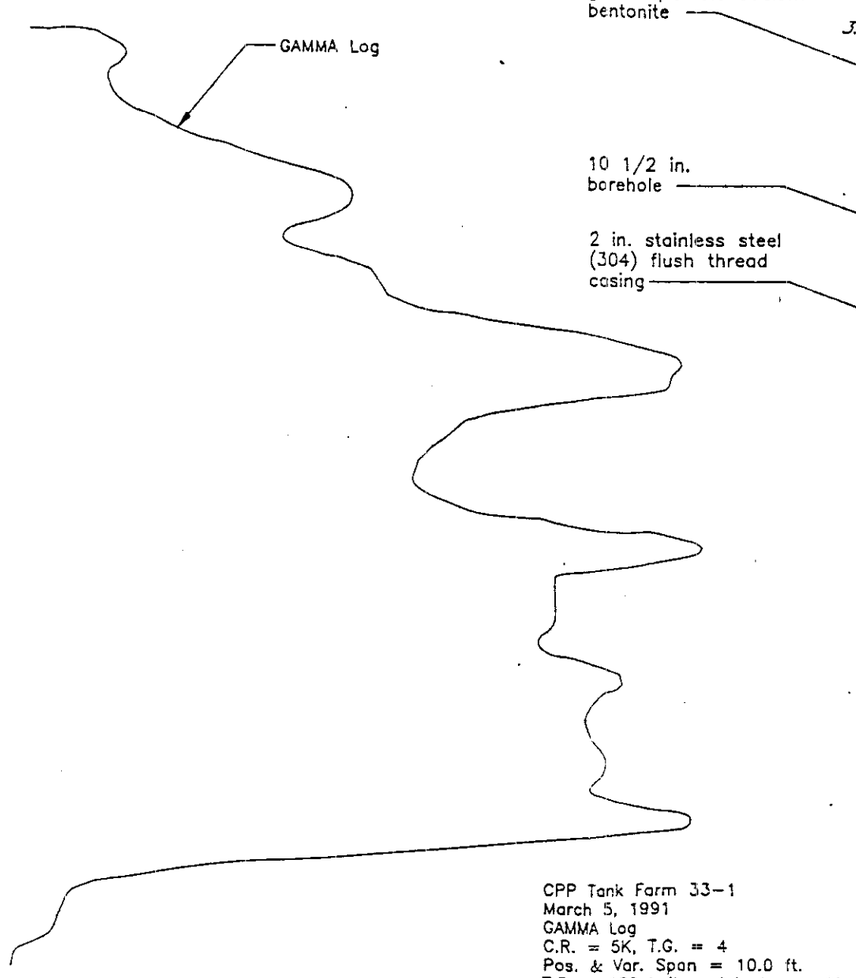
30

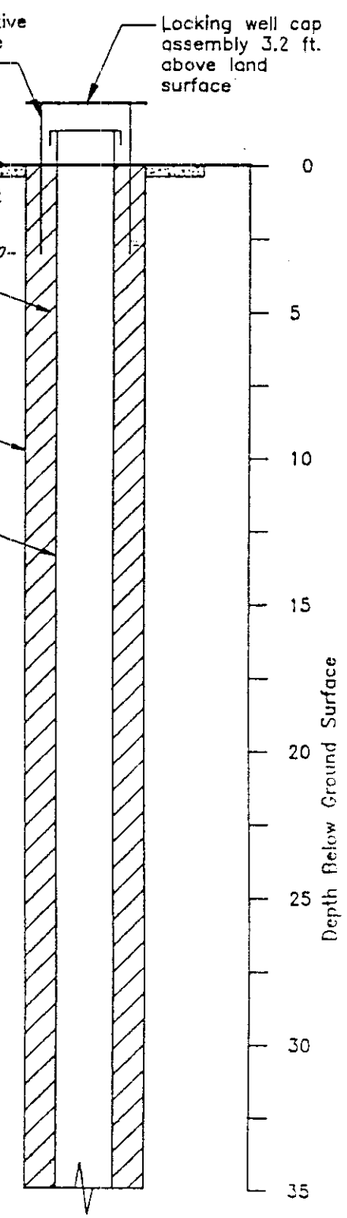
30.0-32.0: Driller augered through interval

34.0-36.0: Driller augered through interval

35

GEOPHYSICAL LOGGING





CPP Tank Farm 33-1
March 5, 1991
GAMMA Log
C.R. = 5K, T.G. = 4
Pos. & Var. Span = 10.0 ft.
T.D. = 109.4 ft., detector +- 1'
L.S. = 15'/ Min.
By: R. Jensen, D. Edwards

Notes:

1.) All ALLUVIUM samples surveyed by Golder personnnel with Eberline ESP (HP260) unless otherwise noted.
2.) All samples surveyed by GOLDER personnel with OVA were at background leveis. were at background leveis.

FIGURE A-1
SHEET 1 OR 4

GENERALIZED BOREHOLE LOG - WELL SITE CCP 33-1

EG&G\FINAL REPORT\IDAHO

JECT NO 8931195\850 DWG NO 30770 DATE 4/30/91 DRAWN RLM REVIEWED DPF

STRATIGRAPHY

Graphic Log

Sample/ Core Recovery (%)

RQD(%)

Depth in Feet

35

Gravel content increased at 36.0

37.2–38.0: Driller augered through interval

38.0

Compact, dark olive–gray (5Y 3/2), fine to coarse SAND, some silt, trace gravel, moist to wet. (SM). FILL

40

40.0–42.5: Driller augered through interval

42.5

Compact to dense, dark yellowish–brown (10 YR 4/2), SILTY SAND, moist. (SM) FILL

45

48.2

Slightly weathered, vesicular, medium dark gray (N4), aphanitic, medium strong, BASALT, moist.

50

Rubble zone: 48.2 – 48.6

Rubble zone: 54.3 – 56.9

54.5

Fresh to slighily weathered, vesicular, very dusky red (10R 2/2), aphanitic, medium strong, BASALT, moist.

55

56.4

Fresh, vesicular, medium dark gray (N4), aphanitic, strong, BASALT, moist.

57.4

Fresh, masive to slightly vesicular, medium dark gray (N4), aphanitic, strong, BASALT, wet.

60

60.7

Fresh, massive to slightly vesicular, medium dark gray (N4), aphanitic, strong, BASALT, moist.

Rubble zone: 62.0 – 62.7

65

65.5

Fresh, vesicular, blackish–red (5R 2/2), aphanitic, strong to medium strong, BASALT, moist.

67.4

Fresh, vesicular, medium gray (N5), aphanitic, strong to medium strong, BASALT, moist.

70

69.4

Fresh, vesicular, brownish–gray (5Y4/1), aphanitic, strong BASALT, wet.

69.7

Fresh, dense, medium dark gray (N4), to dark gray (N3), aphanitic, strong, BASALT, moist.

Notes:

2.) All ALLUVIUM samples surveyed by Golder personnel with Eberline ESP (HP260) unless otherwise noted. All BASALT samples surveyed by WINCO HP for Beta and Gamma radiation. See Table 6–4 for survey results.

2.) All samples surveyed with OVA were at background levels.

GEOPHYSICAL LOGGING

0 00 10 20

TYPE I & II Portland cement grout w/3–5% sodium bentonite

10 1/2 in. borehole

2 in. stainless steel (304) flush thread casing — 47.8–

6 1/4 in. borehole

stainless steel centralizer

54.0–

Depth Below Ground Surface

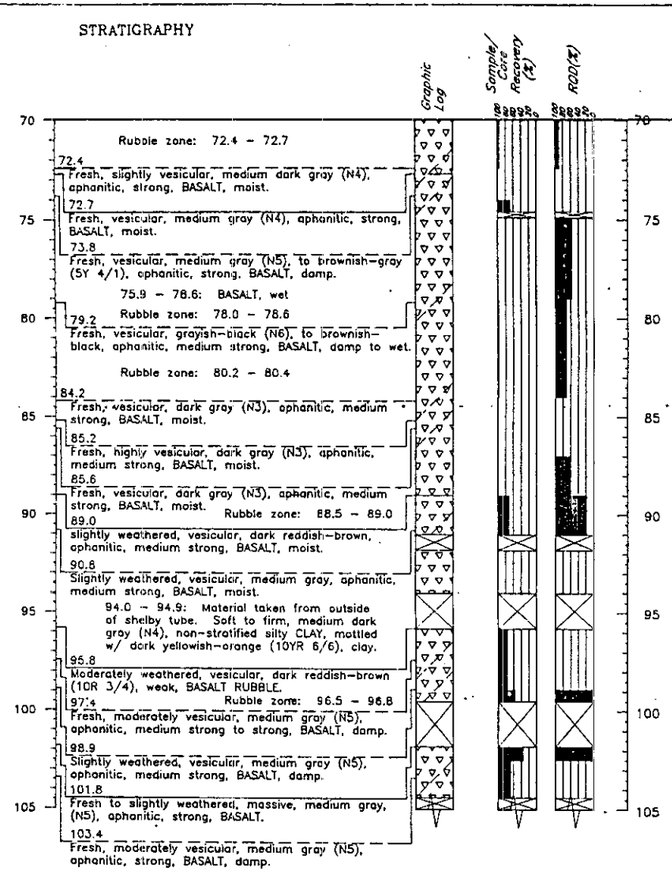
FIGURE A-1
SHEET 2 OF 4

GENERALIZED BOREHOLE LOG - WELL SITE CCP 33-1

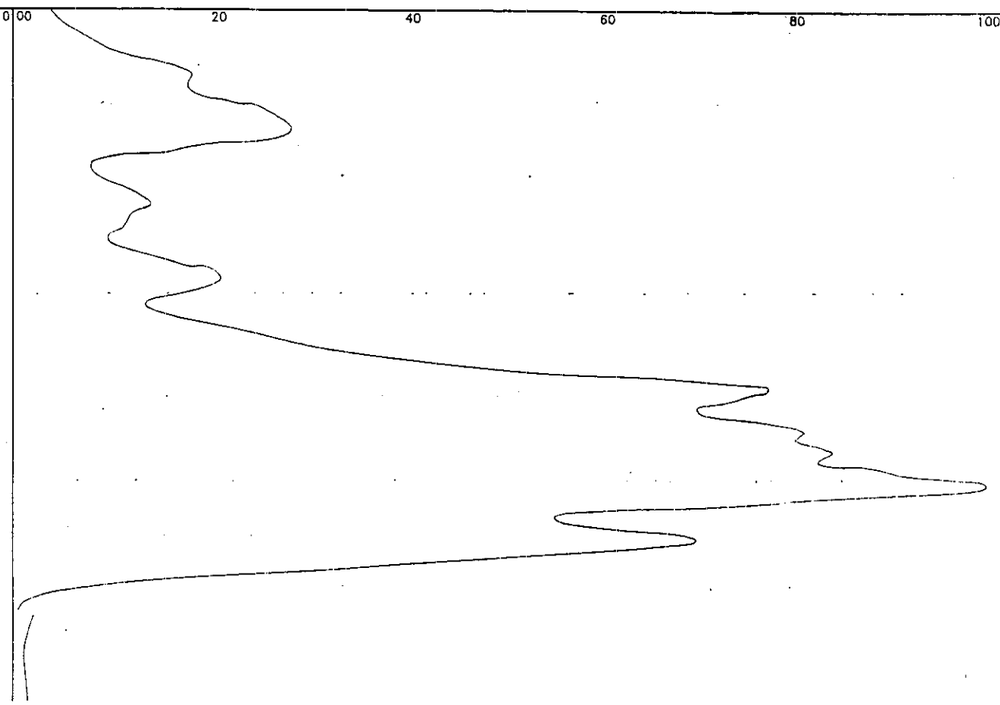
EG&G\FINAL REPORT\IDAHO

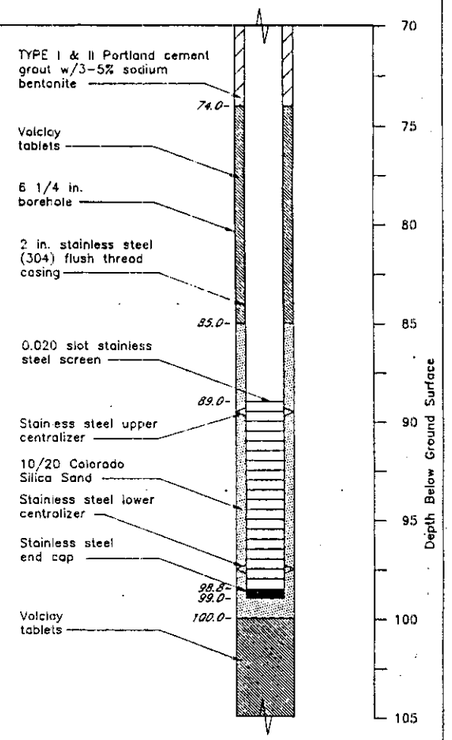
PROJECT NO 8931185\850 DWG NO 30771 DATE 4/30/91 DRAWN RLM REVIEWED DPF

STRATIGRAPHY



GEOPHYSICAL LOGGING





Notes:

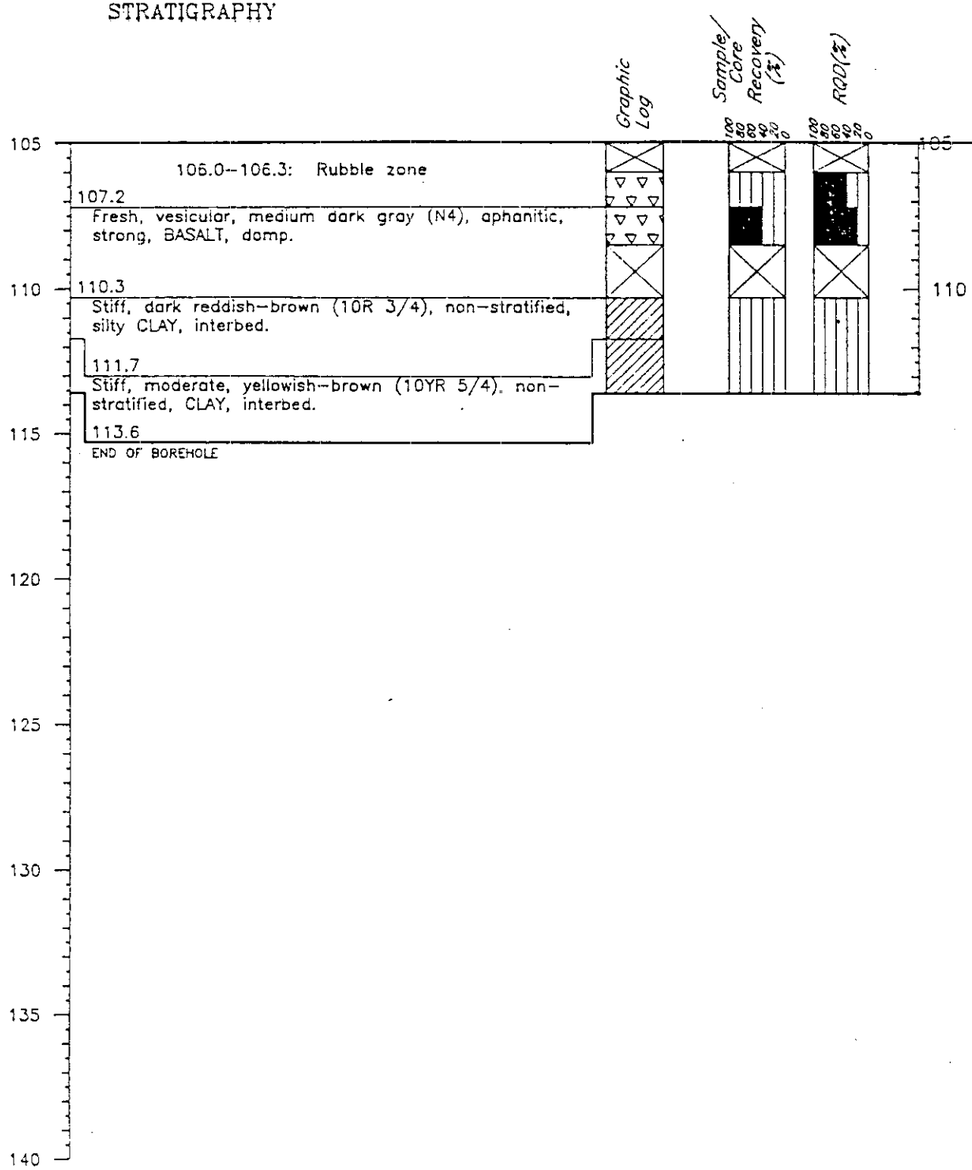
1.) All samples surveyed by WINCO HP for Beta and Gamma radiation. See Table 6-4 for survey results.
2.) All samples surveyed with OVA were at background levels.

FIGURE 3
SHEET 3 OF 4

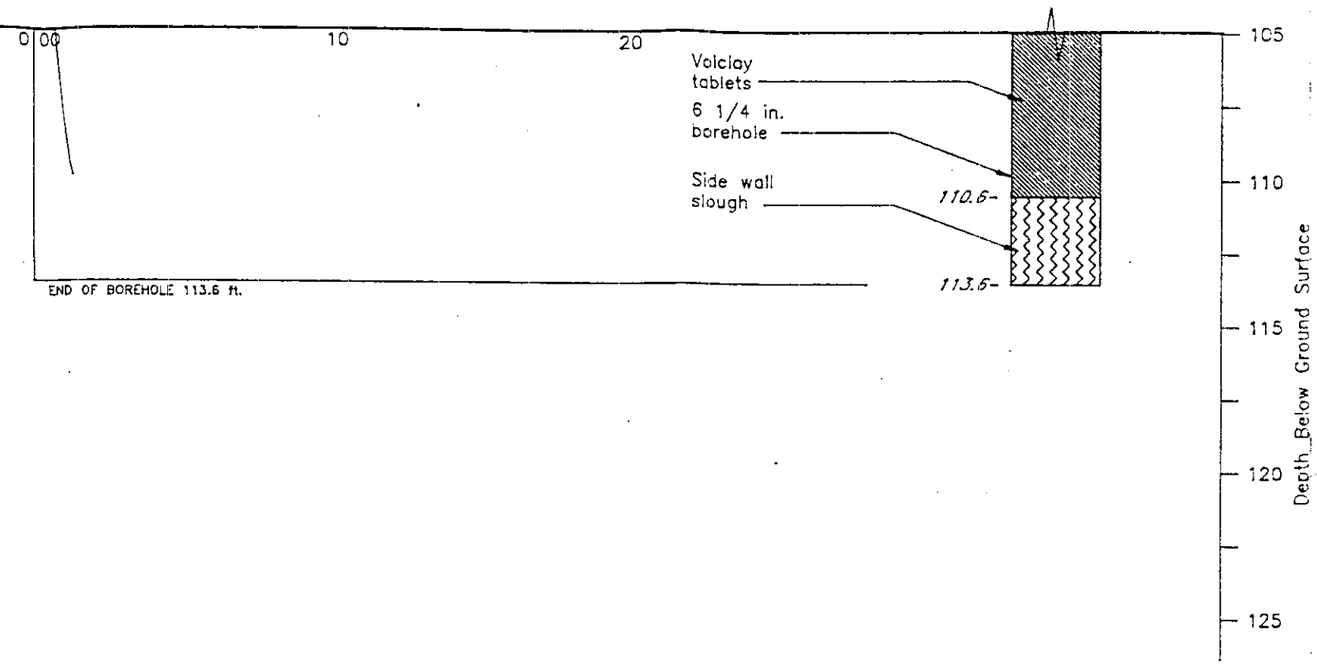
GENERALIZED BOREHOLE LOG - WELL SITE 33-1
EG&G\FINAL REPORT\IDAHO

PROJECT NO 8931195\850 DWG NO 30772 DATE 4/30/91 DRAWN RLM REVIEWED DPF

STRATIGRAPHY



GEOPHYSICAL LOGGING



Notes:

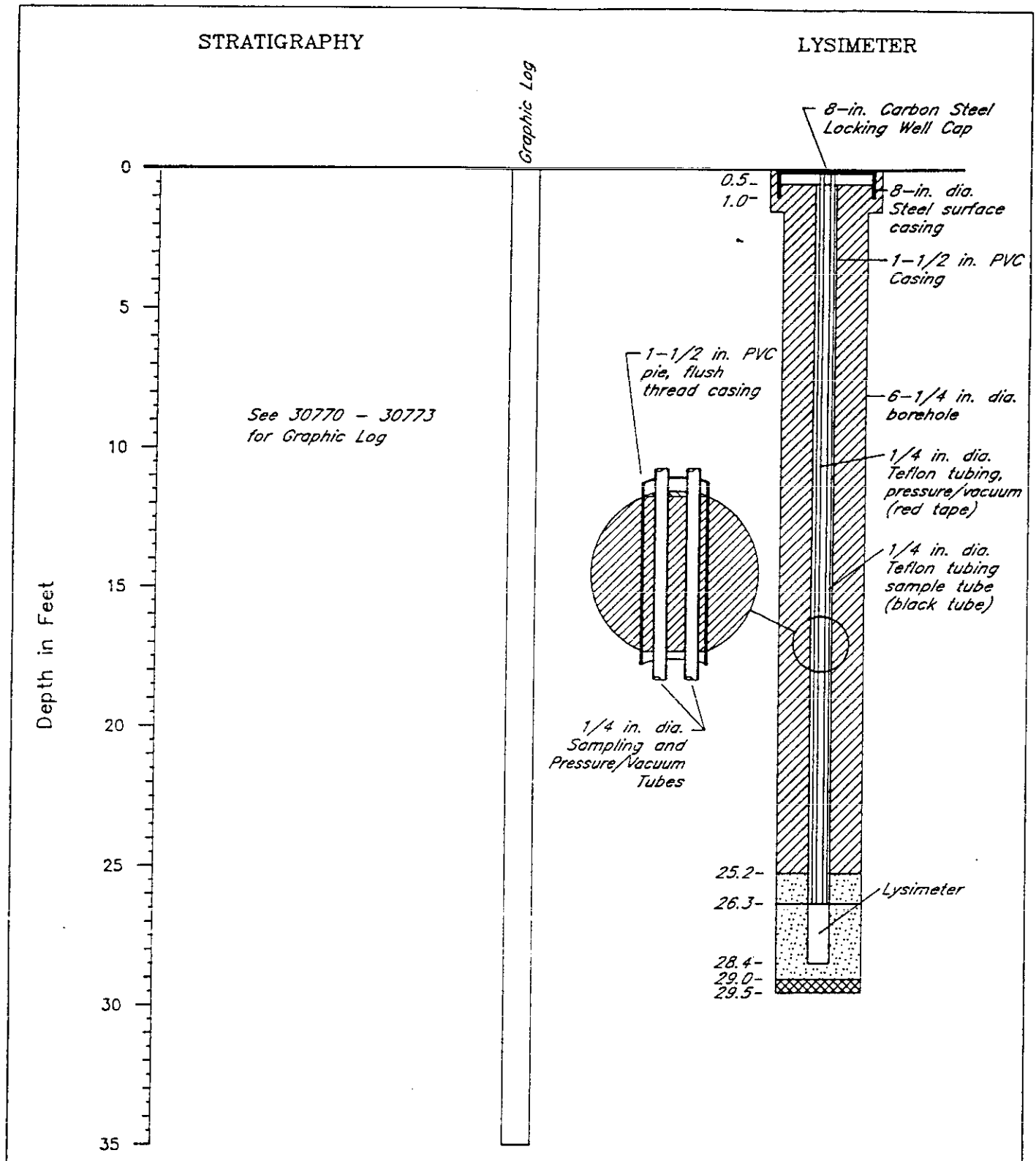
1.) All samples surveyed by WINCO HP for Beta and Gamma radiation were at background levels.
2.) All samples surveyed with OVA were at background levels.

FIGURE 4
SHEET 4 OF 4

GENERALIZED BOREHOLE LOG - WELL SITE 33-1

EG&G\FINAL REPORT\IDAH

JECT NO 8831185\850 DWG NO 30773 DATE 4/30/91 DRAWN RLM REVIEWED DPF



LYSIMETER COMPLETION LEGEND:

- Cement Grout 3-5% Bentonite
- Powdered Bentonite
- Volclay Tablets
- Sidewall Slough & Volclay Tablets
- Silica Flour with 2% Bromide Tracer
- Sidewall Slough

NOT TO SCALE

Date: 3/15-19/91
Hydrogeologist: S.B. and T.G.
Drilling Contractor: Hawley Bros.
Drill Method: Hollow Stem Auger
Sampling Method: -

FIGURE A-2
SHEET 1 OF 1

LYSIMETER CPP 33-1
RECORD OF DRILLHOLE
INEL

PROJECT NO 893-1195.850 DWG NO 30783 DATE 4/12/91 DRAWN RLM REVIEWED ___

APPENDIX B

CHAIN OF CUSTODY

INFORMATION ONLY

1. PURPOSE

This instruction establishes the requirements for documenting and maintaining environmental sample chain of custody from the point of origin to receipt of the sample at the analytical laboratory.

2. APPLICABILITY

When specifically invoked by project work plans, sampling plans, or QA plans, this instruction shall apply to all types of soil, water, and/or core samples collected in environmental investigations by Golder Associates Inc., and is applicable from the time of sample acquisition until custody of the sample is transferred to an analytical or geotechnical laboratory.

3. DEFINITIONS

3.1 Custody

Custody refers to the physical responsibility for sample integrity, handling, and/or transportation. Custody responsibilities are effectively met if the samples are:

- in the responsible individual's physical possession,
- in the responsible individual's visual range after having taken possession,
- secured by the responsible individual so that no tampering can occur, or
- secured or locked by the responsible individual, in an area in which access is restricted to only that individual.

3.2 Chain of Custody

Chain of custody refers to the history of the physical transfer of samples between the Sampler, the transporter or carrier, and the Laboratory Sample Custodian. Chain of custody documentation is required as evidence that the integrity of samples was maintained during transfer.

4. REFERENCES

4.1 EPA, 1986, NEIC Policies and Procedures; US Department of Ecology, National Enforcement Investigations Center, Denver, Colorado.

4.2 Golder Associates Technical Procedure TP-1.2-2, "Geotechnical Rock Core Logging."

5. DISCUSSION

Environmental samples must be tracked, handled and transported in a manner such that sample integrity and identification (to the location and interval at which they were obtained) is maintained. The Sample Custodian must maintain proper storage and custody of samples from the time of collection until transport to the laboratory. The Sampler shall initiate Chain of Custody forms which accompany samples from the collection site to the laboratory and provide documentation of any transfer of custody throughout transport. Sample identification and integrity shall be ensured by the application of seals and labels to the sample containers at the time of sample collection. Seals and labels shall be verified upon receipt of samples at the analytical laboratory; unacceptable samples shall be identified on the Chain of Custody form, and referred to the Geologist/Field Engineer or Project Manager for evaluation and appropriate disposition.

6. RESPONSIBILITIES

6.1 Project Manager

The Geologist/Field Engineer is responsible for the overall management of sampling environmental activities, for designating the sample shipment method (considering permitted sample holding times), for delegating sampling responsibilities to qualified personnel, and reviewing any Procedure Alteration Checklists that may be initiated during the investigation, and for delegating Document Custodian responsibilities to suitably qualified personnel.

6.2 Geologist/Field Engineer

The Geologist/Field Engineer is responsible for: 1) general supervision of sampling operations as directed by the Project Manager; 2) ensuring proper temporary storage of samples, and proper transportation of samples from the sampling site to the laboratory; and 3) initiating Procedure Alteration Checklists when required. The Geologist/Field Engineer is also responsible for tracking Chain of Custody forms for samples to ensure timely receipt of the completed original, for reviewing Chain of Custody forms to ensure appropriate documentation of sample transfers, and for advising the Project Manager of any problems observed that are related to sample integrity and chain of custody. The Geologist/Field Engineer may delegate document tracking and review responsibilities to suitably qualified personnel.

6.3 Sampler

The Sampler may be the same individual as the Geologist/Field Engineer and is responsible for: 1) sample acquisition in compliance with applicable procedures; 2) for checking sample integrity and document prior to transfer; 3) for initiating the Chain of Custody form; 4) for initial transfer of samples; and 5) for physically transferring the samples to the transporter.

6.4 Laboratory Sample Custodian

The Laboratory Sample Custodian (or designated sample receiving technician) is responsible for: 1) inspecting transferred samples to ensure that seals are intact, that labels are affixed, that sample condition is acceptable, and that Sample Integrity Data Sheets are available, when required for a particular project; 2) for completion of the Chain of Custody form upon receipt and for forwarding copies of the completed Chain of Custody form to the Project Manager; and 3) for segregating and identifying unacceptable samples, and subsequent notification of the Project Manager.

6.5 Document Custodian

The Document Custodian is responsible for maintaining completed chain of custody records in the project files, and shall be designated by the Project Manager on a project basis.

7. EQUIPMENT AND MATERIALS

- Seals and labels (Exhibit A)
- Sample Integrity Data Sheets (Exhibit B), if required by the applicable sampling procedure, work plan, sampling plan, or QA plan, or if requested by the Project Manager
- Chain of Custody forms (Exhibit C)
- Procedure Alteration Checklists (Exhibit D)
- Packing and shipping materials, which may include coolers or insulated packing boxes, "blue ice" or dry ice, cardboard packing boxes, wooden core storage boxes, and shipping labels

8. PROCEDURE

8.1 Seals, Labels, and Initial Storage

At the time of collection, all samples shall be labeled, sealed, and appropriately stored in the custody of the sample custodian (as defined in 3.1 above). Examples of standard seals and labels are included in Exhibit A.

8.2 Sample-Packaging

All samples shall be packaged appropriately for shipping to protect them from damage, to ensure that moisture content and/or chemical integrity is maintained where necessary, and to ensure that appropriate temperatures are maintained as required. All sample shipping containers shall be sealed (see Exhibit A) to identify possible tampering. If shipping containers cannot be

adequately sealed, seals shall be placed on individual sample bottles.

Environmental core sample boxing, marking, and labeling shall be in compliance with Section 8.3 of TP-1.2-2, "Geotechnical Rock Core Logging." Other types of environmental samples stored in jars or bottles may be packaged in insulated coolers, or, if sample temperature is not a concern, in the original sample container packing boxes. Beginning with the first sample taken, jars shall be placed in shipping containers from the top right corner downward, and from left to right as shown in Figure 8.1. A label containing the following information shall be affixed to the front of each shipping container:

- Project Number
- Location
- Borehole number
- Date collected
- Sample numbers enclosed

Boxes shall be numbered consecutively; the last box from a borehole and drillhole shall also be identified "EOH", i.e, end of hole. Where cooling is required, samples shall be shipped in insulated coolers containing "blue ice" packages sufficient to keep the samples below 4° Centigrade but above freezing.

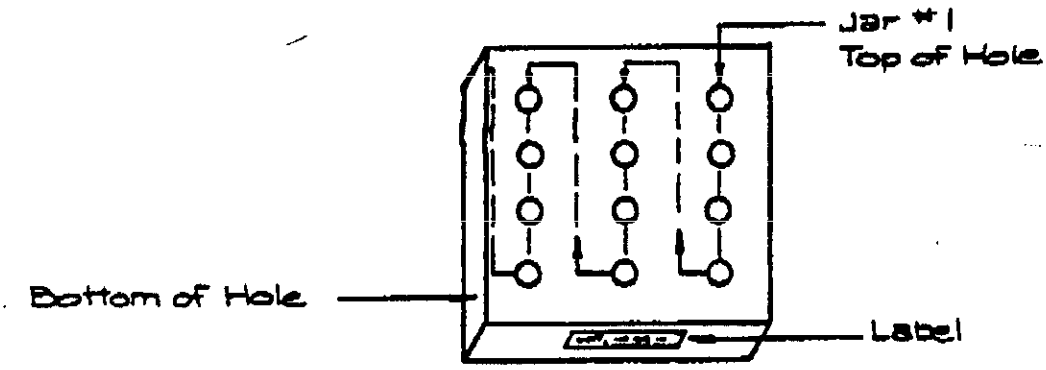
8.3 Sample Examination

Prior to transfer of samples, the Sampler shall ensure that:

- labels are affixed and completely filled out,
- seals are intact and completely filled out,
- special handling and storage requirements are identified where required,
- Sample Integrity Data Sheets (Exhibit B) are available where required by applicable sampling procedures or the Project Manager,
- there are no indications of sample container leaks or other questionable conditions that may affect the integrity of the sample, and that
- hazardous and/or radioactive samples are clearly identified as such.

Samples that do not meet the requirements for initial transfer shall be referred to the Geologist/Field Engineer for disposition.

FIGURE 8-1



8.4 Chain of Custody Form Initiation

The Sampler shall initiate the Chain of Custody form (Exhibit C) for the initial transfer of samples. The following information shall be entered on the form:

- the destination of the samples and the transporter or carrier,
- the date by which the laboratory should acknowledge receipt,
- the project identification and sampling site,
- the date and time of sample collection,
- the sample identification numbers and descriptions.

When all required information has been entered the Sampler shall sign the Chain of Custody form as the initiator.

8.5 Transfer of Custody

To document the initial transfer of samples, the Sampler relinquishing custody and the transporter accepting custody shall sign, date, and note the time of transfer on the Chain of Custody form. If the transporter is not an employee of Golder Associates Inc., the Sampler may identify the carrier and reference the bill of lading number in lieu of the transporter's signature. The Chain of Custody form is in triplicate. One copy of the Chain of Custody form shall be forwarded to the Geologist/Field Engineer by the Sampler. The original form and the remaining copy shall accompany the samples.

8.6 Receipt at Destination

The Laboratory Sample Custodian shall inspect the transferred samples to ensure that:

- the seals are intact
- the labels are affixed and legible
- Sample Integrity Data Sheets are available where required
- the physical condition of the samples is acceptable, and
- the samples being transferred directly correspond to those listed on the Chain of Custody form

If the integrity of the samples is questionable, the Laboratory Technician shall notify the Project Manager, segregate the unacceptable samples and identify them on the Chain of Custody Form. Otherwise, the Laboratory Sample Custodian and the transporter shall sign, date, and note the time of transfer

on the Chain of Custody form. If the transporter is not an employee of Golder Associates Inc., the Laboratory Sample Custodian may identify the carrier and reference the bill of lading number in lieu of the transporter's signature. The Laboratory Sample Custodian shall retain the remaining copy of the Chain of Custody form and forward the original to the Geologist/Field Engineer. Appropriate laboratory custody procedures shall be initiated upon completion of transfer of custody in compliance with the laboratory's internal QA program requirements.

8.7 Document Tracking

The copy of the Chain of Custody form recording the initial transfer of samples shall be forwarded to the Geologist/Field Engineer, followed by the completed original. The Geologist/Field Engineer shall track the Chain of Custody form to ensure timely completion and receipt of the original, based on the laboratory acknowledgement due date indicated on the form.

After receipt of the completed original, the Geologist/Field Engineer may discard the copy. The completed original Chain of Custody form shall be forwarded to the Document Custodian. Chain of Custody forms determined to be overdue or incorrectly completed shall be referred to the Project Manager for appropriate action.

8.8 Procedure Alteration Checklist

Variation from established procedure requirements may be necessary due to unique circumstances encountered on individual projects. All variations from established procedures shall be documented on Procedure Alteration Checklists (Exhibit D) and reviewed by the Project Manager and the QA Manager.

The Project Manager may authorize individual Geologist/Field Engineers to initiate necessary variations. If possible, the request for variation shall be reviewed by the Project Manager and the QA Manager prior to implementation. If prior review is not possible, the variation may be implemented immediately at the direction of the Geologist/Field Engineer, provided that the Project Manager is notified of the variation within 24 hours of the implementation, and the Procedure Alteration Checklist is forwarded to the Project Manager and QA Manager within 2 working days of implementation. If the variation is unacceptable to either reviewer, the activity shall be reperformed or action shall be taken as indicated in the Comments section of the reviewed Checklist. All completed Procedure Alteration Checklists shall be maintained in project records.

EXHIBIT A

Golder Associates

Location _____
Job No._____ Date _____
Boring No._____ Sample No._____
Depth _____ Blows _____
Description _____
_____
_____
_____
Driller _____ Engr._____

Golder Associates

Sample I.D. No.

Date _____ Time _____
Station _____ Depth _____
Media _____
Preservative _____
Sampled by _____

Golder Associates
Seal Number
2455

Sent By: _____
Date: _____

EXHIBIT B

SAMPLE INTEGRITY DATA SHEET

Plant/Site _____ Project No. _____

Site Location _____ Sample ID _____

Sampling Location _____

_____

Technical Procedure Reference(s) _____

Type of Sampler _____

Date _____ Time _____

Media _____ Station _____

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

_____

_____

_____

Sample Description _____

_____

_____

Field Measurements on Sample (pH, conductivity, etc.) _____

_____

_____

_____

Aliquot Amount	Container	Preservation/Amount

Sampler (signature) _____ Date _____

Supervisor (signature) _____ Date _____

EXHIBIT C

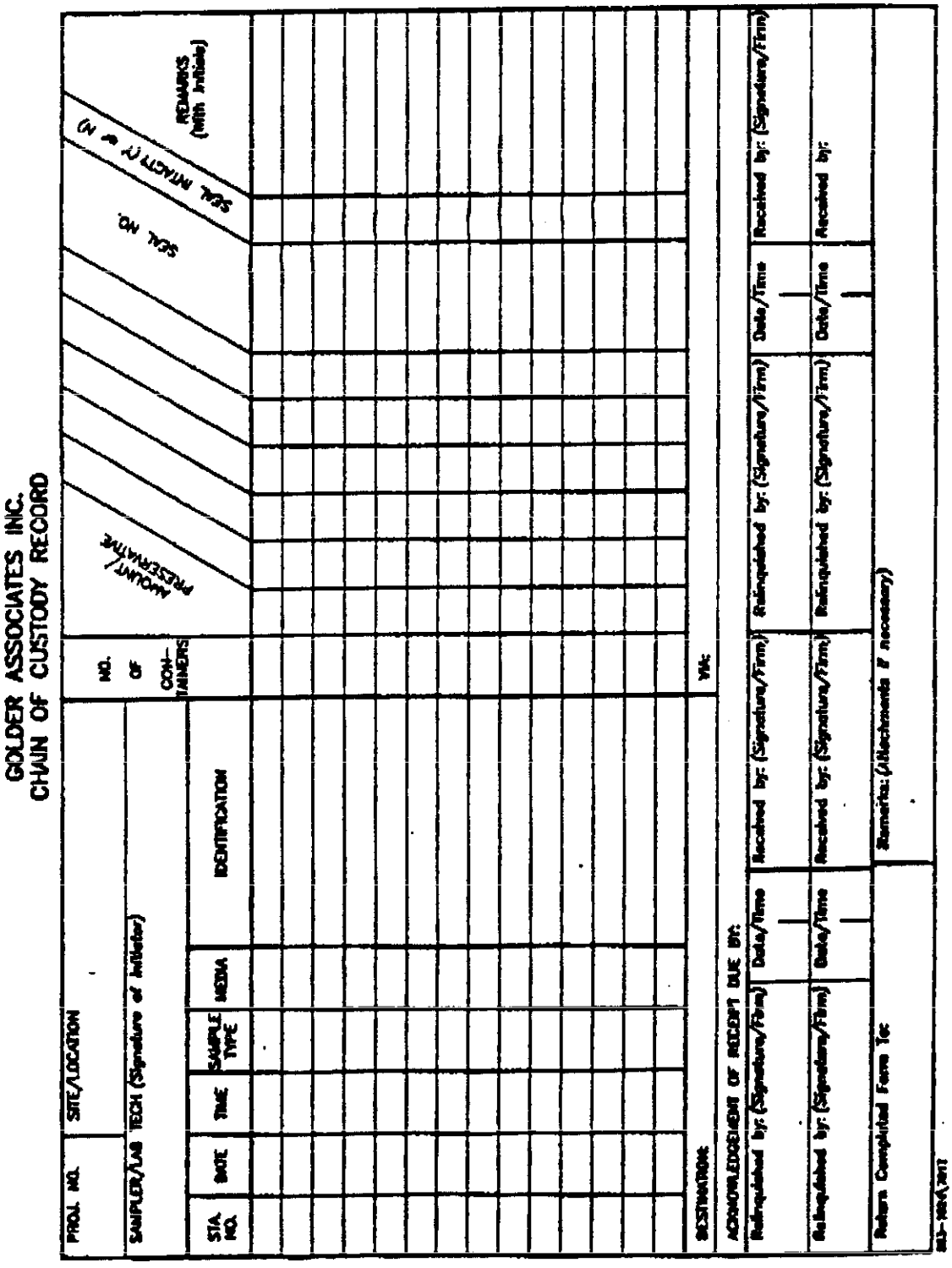

GOLDER ASSOCIATES INC.
CHAIN OF CUSTODY RECORD
PROJ. NO.
SITE/LOCATION
SAMPLER/LAB TECH (Signature of Initiator)
STA. NO.
DATE
TIME
SAMPLE TYPE
MEDIA
IDENTIFICATION
NO. OF CONTAINERS
AMOUNT/ PRESERVATIVE
SEAL NO.
SEAL INTACT? (Y or N)
REMARKS (With Initials)
VIA:
DESTINATION:
ACKNOWLEDGEMENT OF RECEIPT DUE BY:
Relinquished by: (Signature/Firm)
Date/Time
Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)
Date/Time
Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)
Date/Time
Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)
Date/Time
Received by:
Return Completed Form To:
Remarks: (Attachments if necessary)

EXHIBIT D

PROCEDURE ALTERATION CHECKLIST

Job/Task Number: _____

Procedure Reference: _____

Requested Variation: _____

Reason for Variation: _____

Special Equipment, Material or Personnel Required: _____

Alteration Requested By: _____ Date: _____

Title: _____

Reviewed By: _____ Date: _____

Title: GAI Project Manager

Comments: _____

Reviewed By: _____ Date: _____

Title: GAI QA Manager

Comments: _____

APPENDIX C

FIELD DUPLICATE ANALYSIS RESULTS
LAND DISPOSAL UNIT CPP-33 BOREHOLE 1

TABLE C-1

FIELD DUPLICATE ANALYSIS RESULTS
SITE 1 (BOREHOLE 1) CPP-33

Sample ID: CPP-33-01-TX/R-39-13
CPP-33-01-V2-39-13

Analyte/ Compound	Sample Result (mg/kg)	Duplicate Result (mg/kg)	Relative Percent Difference
Arsenic	5.5	6.3	13.6
Barium	144.	133.	7.9
Cadmium	8.2	7.8	5.0
Chromium	31.8	30.2	5.2
Lead	19.5	17.1	13.1
Mercury	0.12	0.15	22.2
Silver	0.72	0.68	5.7
pH	9.38 SU	9.15 SU	2.5
Percent Solids	83 %	88 %	5.8
Cesium-137	0.42±0.07 pCi/g	3.82±0.59 pCi/g	160.4

TABLE C-2

FIELD SPLIT SAMPLE ANALYSIS RESULTS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1

Golder Sample ID	CPP33-01-TX-1-1	CPP33-01-TX-1-1	RPD
Lab Sample ID	9102253-15	9102253-17	
Inorganic Results	mg/Kg	mg/Kg	
Arsenic	3.7	3.2	14.5
Barium	74.8	10.6	150.4
Cadmium	3.8	0.52	151.9
Chromium	16.4	2.5	147.1
Lead	9.6	1.8	136.8
Mercury	1.51	0.03	192.2
Silver	0.83	0.50 U	NC
pH	10.2 SU	10.0 SU	2.0
Radionuclides	pCi/g	pCi/g	
Americium-241	2.04 ± 0.87	0.05 U	NC
Plutonium-238	0.46 ± 0.14	0.05 U	NC
Plutonium-239	0.34 ± 0.12	0.05 U	NC
Strontium-90	2.87 ± 0.20	0.59 ± 0.12	131.8
Uranium-234	0.09 ± 0.02	0.12 ± 0.03	28.6
Uranium-238	0.09 ± 0.03	0.10 ± 0.03	10.5

U - Analyte was not detected at the given detection limit.

NC - Not calculable due to one or both results at or below the sample detection limit or not detected.

RPD - Relative percent difference is calculated by taking the absolute value of the difference between two measurements divided by the average of the two measurements, multiplied by 100.

TABLE C-2 (Cont.)

FIELD SPLIT SAMPLE ANALYSIS RESULTS
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1

Golder Sample ID	CPP33-01-TX-3-2	CPP33-01-TX-3-2	RPD
Lab Sample ID	9102253-05	9102253-13	
Inorganic Results	mg/Kg	mg/Kg	
Arsenic	3.2	3.4	6.1
Barium	81.5	82.1	0.7
Cadmium	3.9	4.2	7.4
Chromium	16.8	17.1	1.8
Lead	10.6	10.6	0
Mercury	0.27	0.13	70.0
Silver	0.73	0.73	0
pH	10.1 SU	8.91 SU	12.5
Radionuclides	pCi/g	pCi/g	
Plutonium-238	0.05 U	0.55 ± 0.13	NC
Strontium-90	0.35 ± 0.10	201.8 ± 1.5	199.3
Uranium-234	0.15 ± 0.05	0.11 ± 0.02	30.8
Uranium-238	0.13 ± 0.04	0.12 ± 0.02	8.0

U - Analyte was not detected at the given detection limit.

NC - Not calculable due to one or both results at or below the sample detection limit or not detected.

RPD - Relative percent difference is calculated by taking the absolute value of the difference between two measurements divided by the average of the two measurements, multiplied by 100.

APPENDIX D

LIST OF COMPOUNDS ANALYZED
LAND DISPOSAL UNIT CPP-33 BOREHOLE 1

TABLE D-1

LIST OF ANALYTES/COMPOUNDS ANALYZED
LAND DISPOSAL UNIT CPP-33 BOREHOLE 1

Volatile Organic Compounds	Analytical Method
Chloromethane	CLP SOW 2/88
Bromomethane	
Vinyl Chloride	
Chloroethane	
Methylene Chloride	
Acetone	
Carbon Disulfide	
1,1-Dichloroethene	
1,1-Dichloroethane	
1,2-Dichloroethene (total)	
Chloroform	
1,2-Dichlorothane	
2-Butanone	
1,1,1-Trichloroethane	
Carbon Tetrachloride	
Vinyl Acetate	
Bromodichloromethane	
1,2-Dichloropropane	
cis-1,3-Dichloropropene	
Trichloroethene	
Dibromochloromethane	
1,1,2-Trichloroethane	
Benzene	
trans-1,3-Dichloropropene	
Bromoform	
4-Methyl-2-pentanone	
2-Hexanone	
Tetrachloroethene	
1,1,2,2-Tetrachloroethane	
Toluene	
Chlorobenzene	
Ethylbenzene	
Styrene	
Xylene (total)	

TABLE D-1 (Cont.)

LIST OF ANALYTES/COMPOUNDS ANALYZED
LAND DISPOSAL UNIT CPP-33 BOREHOLE 1

Inorganic Analytes	Analytical Method
pH	9045[1]
Arsenic	7060[1]
Barium	6010[1]
Cadmium	6010[1]
Chromium	6010[1]
Lead	7421[1]
Mercury	7471[1]
Selenium	7740[1]
Silver	6010[1]

[1]Methods are from Test Methods for Evaluating Solid Waste, SW846, Third Edition, November 1986.

TABLE D-1 (Cont.)

LIST OF ANALYTES/COMPOUNDS ANALYZED
LAND DISPOSAL UNIT CPP-33 BOREHOLE 1

Radionuclides	Analytical Method
Americium-241	EERF Am-01[1]
Antimony-125	EPA 901.1[2]
Cerium-144	EPA 901.1[2]
Cesium-134	EPA 901.1[2]
Cesium-137	EPA 901.1[2]
Cobalt-58	EPA 901.1[2]
Cobalt-60	EPA 901.1[2]
Iodine-129	EPA 901.1[2]
Neptumium-237	EML Np-01[3]
Plutonium-238	EERF Pu-01[1]
Plutonium-239	EERF Pu-01[1]
Plutonium-240	EERF Pu-01[1]
Ruthenium-103	EPA 901.1[2]
Ruthenium-106	EPA 901.1[2]
Strontium-90	EML Sr-05[3]
Uranium-234	EERF 00-07[1]
Uranium-235	EERF 00-07[1]
Uranium-238	EERF 00-07[1]

[1]Eastern Environmental Radiation Facility, Radiochemistry Procedures Manual, EPA 520/5-84-006, (EPA, 1984)

[2]Prescribed Procedures for the Measurement of Radioactivity in Drinking Water, EPA 600/4-80-032, (EPA, 1982)

[3]EML Procedures Manual, 25th Edition, (DOE, 1982)

APPENDIX E

SAMPLE RESULTS
FOR INORGANIC AND RADIONUCLIDES
ANALYSIS AS REPORTED BY THE LABORATORY
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1

TABLE E-1

EXPLANATION OF INOGANIC RESULTS QUALIFIERS

B - Indicates the reported value and less than the contract required quantitation limit but greater than or equal to the instrument detection limit.

U - Indicates the analyte was analyzed for but not detected at the value reported.

E - Indicates the reported value is estimated because of the presence of an interference.

M - Indicates the duplicate injection precision was not met.

N - Indicates the spiked sample recovery was not within the control limit.

S - Indicates the reported value was determined by the method of standard additions.

W - The post digestion spike for the furnace AA analysis was out of control limits while the sample absorbance was less than 50% of the spike absorbance.

* - The duplicate analysis was not within control limit.

+ - The correlation coefficient for the MSA was less than 0.995.

P - The analyte was determined by ICP analysis.

A - The analyte was determined by Flame AA.

F - The analyte was determined by Furnace AA.

CV - The analyte was determined by Cold Vapor AA.

NR - The analyte is not required to be analyzed.

E-1 Sample Identification

Samples were identified and sealed using the standard identification labels and seals shown in Exhibit D of TP-1.2-5. Samples exhibiting radioactivity >100 cpm above background were tagged with a WINCO radiation label and marked with the calculated microcurie reading provided by the WINCO HP. Sample numbers shall be assigned in the following format:

> CPP33 (LDU designator)-BB (borehole number)-CC (analytical code, from Table 4-3)-DD (sample interval, in feet)-EE (sequential number, by borehole)-FF (additional type designator for Quality Control samples).

Table 4-3 includes a listing of alphanumerical container codes for the various types of analyses to be performed. Parameter lists applicable to all operable units are defined in Section 4 of the Technical Work Plan (Volume I) (Golder Associates, 1991a). Additional sample number designators required for field Quality Control (QC) were entered as FB if a field blank EB if an equipment blank; or FD if a field duplicate. Samples footages and intervals were entered as -00- for trip blanks and field blanks. Examples of sample identifications for LDU CPP-33 are shown below. Since spiked samples or reference samples prepared for performance audit purposes must be submitted blind to the analytical laboratory they were numbered as if they were field blanks or equipment blanks.

Samples obtained from the borehole were identified as follows (example: borehole number 1, surface to 2-foot interval):

Sample ID	Description	Analyses
CPP33-01-TX-1-1	Surface to 2 feet	RCRA Metals, pH
CPP33-01-R-1-1	Surface to 2 feet	Radionuclides
CPP33-01-V2-1-1	Surface to 2 feet	Volatile Organics

CPP33-01-V2-EB	Equipment Blank	Volatile Organics
CPP33-01-TX-EB	Equipment Blank	RCRA Metals, pH
CPP33-01-M-EB	Equipment Blank	Mercury
CPP33-01-R-EB	Equipment Blank	Radionuclide
CPP33-01-TB	Trip Blank	
CPP33-01-V2-1-1-FD	Surface to 2 foot, Field Duplicate	Volatile Organics
CPP33-01-TX-1-1-FD	Surface to 2 foot, Field Duplicate	RCRA Metals, pH
CPP33-01-R-1-1-FD	Surface to 2 foot, Field Duplicate	Radionuclide

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-11-6

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.: CPP33-01 Lab Sample ID: 9102253-03 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 95.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.26			F
7440-39-3	Barium	61.05			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	3.26			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	11.89			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	8.74			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.24			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.53			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TX/R-5-3

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.: CPP33-01 Lab Sample ID: 9102253-04 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 95.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	2.95			F
7440-39-3	Barium	58.11			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	2.74			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	11.26			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	7.37			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.63			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX-3-2

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.: CPP33-01 Lab Sample ID: 9102253-05 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 96.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.23			F
7440-39-3	Barium	81.46			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	3.85			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	16.77			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	10.63			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.27			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.73			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TX-3-2

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.: CPP33-01 Lab Sample ID: 9102253-13 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 96.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.44			F
7440-39-3	Barium	82.08			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.17			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	17.08			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	10.63			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.73			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX-1-1

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID: 9102253-15 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 96.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.65			F
7440-39-3	Barium	74.79			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	3.75			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	16.35			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	9.58			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	1.51			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.83			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TX-1-1

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102253-17 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 96.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.23			F
7440-39-3	Barium	10.63			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	0.52			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	2.50			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	1.77			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.50	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-7-4

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102253-19 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 93.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	2.80			F
7440-39-3	Barium	66.13			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	3.23			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	13.44			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	9.68			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.16			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.54			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-9-5

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102253-20 Date Received: 02/13/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 93.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.73			F
7440-39-3	Barium	75.81			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.09			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	15.59			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	11.72			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.54			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

M-O-EB

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102283-08 Date Received: 02/14/91

Matrix (soil/water): WATER Level (low/med):LOW

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.4	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX-O-EB

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102283-09 Date Received: 02/14/91

Matrix (soil/water): WATER Level (low/med):LOW

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	10.0	U		F
7440-39-3	Barium	10.0	U		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	1.0	U		F
7440-70-2	Calcium				NR
7440-47-3	Chromium	10.0	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.4	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	10.0	U		F
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-37-12

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-04 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 94.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	5.53			F
7440-39-3	Barium	61.06			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.57			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	13.30			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	9.57			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.0	U		F
7440-22-4	Silver	0.64			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-39-13

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-05 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 83.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	5.54			F
7440-39-3	Barium	144.22			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	8.19			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	31.81			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	19.52			NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.72			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TX/R-39-13-FD

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-06 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 88.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	6.25			F
7440-39-3	Barium	132.50			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	7.73			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	30.23			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	17.05			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.15			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.68			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-17-7

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-08 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 96.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.06			F
7440-39-3	Barium	81.88			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.79			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	15.73			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	11.98			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.52			NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-21-8

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-09 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 92.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.57			F
7440-39-3	Barium	82.72			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.11			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	17.72			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	11.41			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.14			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.54			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-25-9

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-10 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 95.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	3.89			F
7440-39-3	Barium	88.84			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.95			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	16.32			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	12.21			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.53			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-29-10

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-11 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 93.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.30			F
7440-39-3	Barium	90.97			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	4.62			NR
7440-70-2	Calcium				NR
7440-47-3	Chromium	15.81			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	12.15			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.19			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.65			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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1 EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-33-11

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-12 Date Received: 02/18/91

Matrix (soil/water): SOIL Level(low/med) :LOW

% Solids: 93.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.30			F
7440-39-3	Barium	57.63			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	2.69			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10.11			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	6.88			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.15			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.54			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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Comments:

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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

TX/R-41-14

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-14 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 87.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.83			F
7440-39-3	Barium	158.05			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	9.43			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	36.90			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	22.76			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				
7439-97-6	Mercury	0.26			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	1.15			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TX/R-45-15

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-16 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 84.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.88			F
7440-39-3	Barium	193.45			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	11.07			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	40.00			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	25.48			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.71			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TX/R-47-16

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9102336-18 Date Received: 02/18/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 85.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	4.24			F
7440-39-3	Barium	178.35			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	9.06			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	34.12			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	21.06			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	1.00	U		F
7440-22-4	Silver	0.59			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

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Comments:

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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

113-MS

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9103063-01 Date Received: 03/05/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 76.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	1.18			F
7440-39-3	Barium	192.63			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	11.45			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	36.32			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	30.79			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	0.45			F
7440-22-4	Silver	0.92			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

113

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9103063-02 Date Received: 03/05/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 76.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	6.84			F
7440-39-3	Barium	190.79			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	11.05			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	36.97			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	30.53			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	0.78			F
7440-22-4	Silver	0.92			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

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FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

112

Lab Name: C.E.P. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____

SDG No.:CPP33-01 Lab Sample ID:9103063-03 Date Received: 03/05/91

Matrix (soil/water): SOIL Level (low/med):LOW

% Solids: 76.0%

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	5.92			F
7440-39-3	Barium	193.29			P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	11.18			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	33.95			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	31.71			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	0.51			F
7440-22-4	Silver	0.92			P
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR
7440-31-5	Tin				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

INORGANIC DATA ASSESSMENT SUMMARY

PROJECT NO. 893-1195.850 SITE INEL

LABORATORY CEP SAMPLES/MATRIX 19 So.7
1 Water

SDG # CIP33-01

DATA ASSESSMENT SUMMARY

	ICP	AA	HG	~~CYANIDE~~
1. HOLDING TIMES	O	O	O	
2. CALIBRATIONS	O	O	O	
3. BLANKS	O	O	O	
4. ICS	O			
5. LCS	M	M	M	
6. DUPLICATE ANALYSIS	O	O	O	
7. MATRIX SPIKE	O	O	O	
8. MSA		N/A		
9. SERIAL DILUTION	O			
10. SAMPLE VERIFICATION	O	O	O	
11. OTHER QC				
12. OVERALL ASSESSMENT	M	M	M	

O = Data had no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

NOTES: Data as qualified acceptable for use.

Validated by: Dennis Rahman Date: 5/24/91

Reviewed by: _____ Date: _____

SDG # CPP33-01 Project No. 893-1195.850

	Acceptable YES	NO
1. Holding Times	✓	

Samples Collected: Hg Anal:
1-1 thru 11-6 2/8 - 3/4
17-7 thru 33-11 2/12 ↓ all < 28 days
37-12 thru 39-13 PD 2/13
41-14 thru 47-16 2/14
112 & 113 - 5/1/91 3/15

2. Calibrations		

Se - Low Std. 10 ug/L Hg - Low Std .0004 mg/l
all r > 0.995 Hg - only 3 stds, ICS (?) - 4th Conc
Cont. Cal run but in most cases not midrange std.

'J' Cv values for "25 5" samples

3. Blanks	✓	

No contamination in blanks run.

No Continuing Calibration Blanks Run!

4. ICP Interference Check Sample (ICS)		✓

ICSA & ICSAB improperly prepared. ICSA contained analytes ~~only~~ but no interferents, and ICSAB contained interferents but not analytes. Al, Ca, Mg & Fe not reported for any sample.

5. Laboratory Control Sample (LCS)		

Lab did not run solid LCs.
"J" all data
Aqueous LCS %R ok.

6. Duplicate Sample Analysis	✓	

~~Samples run~~ %RPDs ok ✓

7. Matrix Spike Sample Analysis	✓	

%R's ok ✓

SDG # _____ Project No. _____

	Acceptable YES	NO
8. Furnace Atomic Absorption QC		✓

No analytical spikes were analyzed. Unable to determine if duplicate injections were used.

9. ICP Serial Dilution	✓	

253 set qualify Ag results "J"

10. Sample Result Verification		

ICP raw data reports results in ug/g - verified reported results.

11. Field Duplicates	✓	

all RPDs < 35%

12. Overall Assessment		

112 & 113 (0-3 set) "J" As values

Data as qualified acceptable for use.

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Golder Associates, Inc.
4104-148th Avenue, NE
Redmond, WA 98052

Attn: Kent Angelos

Work ID: Enviro., W.Q. & Organics
P O # :

Date Received: 02/13/91
Date Reported: 05/10/91
Work Order: 91-02-253
Category: CLP_CUSTODY

Test	Units	CPP33-01-V2-9--5 02/08/91 14:45	CPP33-01-V2-1--1 02/08/91 13:00	CPP33-01-TX/R--11-6 02/08/91 15:10	CPP33-01-TX/R--5-3 02/08/91 13:50
Silver (total)	ug/gram			0.5	0.6
Arsenic (total)	ug/gram			3.1	2.8
Barium (total)	ug/gram			58.0	55.2
Cadmium (total)	ug/gram			3.1	2.6
Cerium-144	pCi/gram			<0.05	<0.05
Cobalt-58	pCi/gram			<0.09	<0.09
Cobalt-60	pCi/gram			<0.07	<0.07
Chromium (total)	ug/gram			11.3	10.7

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Test	Units	CPP33-01-V2-9--5 02/08/91 14:45	CPP33-01-V2-1--1 02/08/91 13:00	CPP33-01-TX/R--11-6 02/08/91 15:10	CPP33-01-TX/R--5-3 02/08/91 13:50
Cesium-134	pCi/gram			<0.08	<0.08
Mercury (total)	ug/gram			0.23	0.08
Iodine-129	pCi/gram			<0.5	<0.8
Neptunium-237	pCi/gram			<0.5	<0.5
Lead (total)	ug/gram			8.3	7.0
pH	units			9.40	10.20
Percent solids	%	94	96	95	95
Ruthenium-103	pCi/gram			<0.2	<0.2
Ruthenium-106	pCi/gram			<0.07	<0.07
Antimony-125	pCi/gram			<0.03	<0.03

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P.O. BOX 5301 • Santa Fe, New Mexico 87502 OUT OF STATE 800/545-2188 • FAX · 505-982-9289

Test	Units	CPP33-01-V2-9--5 02/08/91 14:45	CPP33-01-V2-1--1 02/08/91 13:00	CPP33-01-TX/R--11-6 02/08/91 15:10	CPP33-01-TX/R--5-3 02/08/91 13:50
Selenium (total)	ug/gram			<1.0	<1.0

Test	Units	CPP33-01-TX-3--2 02/08/91 13:20	CPP33-01-V2-3--2 02/08/91 13:20	CPP33-01-R-1-1 02/08/91 13:00	CPP33-01-V2-7--4 02/08/91 14:15
Silver (total)	ug/gram	0.7			
Arsenic (total)	ug/gram	3.1			
Barium (total)	ug/gram	78.2			
Cadmium (total)	ug/gram	3.7			
Cerium-144	pCi/gram			<0.05	
Cobalt-58	pCi/gram			<0.09	

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Test	Units	CPP33-01-TX-3--2 02/08/91 13:20	CPP33-01-V2-3--2 02/08/91 13:20	CPP33-01-R-1-1 02/08/91 13:00	CPP33-01-V2-7--4 02/08/91 14:15
Cobalt-60	pCi/gram			<0.07	
Chromium (total)	ug/gram	16.1			
Cesium-134	pCi/gram			<0.08	
Mercury (total)	ug/gram	0.26			
Iodine-129	pCi/gram			<0.5	
Neptunium-237	pCi/gram			<0.4	
Lead (total)	ug/gram	10.2			
pH	units	10.1			
Percent solids	%	96	96	97	96
Ruthenium-103	pCi/gram			<0.2	

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Test	Units	CPP33-01-TX-3--2 02/08/91 13:20	CPP33-01-V2-3--2 02/08/91 13:20	CPP33-01-R-1-1 02/08/91 13:00	CPP33-01-V2-7--4 02/08/91 14:15
Ruthenium-106	pCi/gram			<0.07	
Antimony-125	pCi/gram			<0.03	
Selenium (total)	ug/gram	<1.0			

Test	Units	CPP33-01-V2-5--3 02/08/91 14:45	CPP33-01-R-1-1 02/08/91 13:00	CPP33-01-V2-1-1-6 02/08/91 15:10	CPP33-01-TX-3--2 02/08/91 13:20
Silver (total)	ug/gram				0.7
Arsenic (total)	ug/gram				3.3
Barium (total)	ug/gram				78.8
Cadmium (total)	ug/gram				4.0

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Test	Units	CPP33-01-V2-5--3 02/08/91 14:45	CPP33-01-R-1-1 02/08/91 13:00	CPP33-01-V2-1-1-6 02/08/91 15:10	CPP33-01-TX-3--2 02/08/91 13:20
Cerium-144	pCi/gram		<0.05		
Cobalt-58	pCi/gram		<0.09		
Cobalt-60	pCi/gram		<0.07		
Chromium (total)	ug/gram				16.4
Cesium-134	pCi/gram		<0.08		
Mercury (total)	ug/gram				0.12
Iodine-129	pCi/gram		<0.7		
Neptunium-237	pCi/gram		<0.8		
Lead (total)	ug/gram				10.2
pH	units				8.91

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Test	Units	CPP33-01-V2-5--3 02/08/91 14:45	CPP33-01-R-1-1 02/08/91 13:00	CPP33-01-V2-1--1-6 02/08/91 15:10	CPP33-01-TX-3--2 02/08/91 13:20
Percent solids	%	96	96	99	96
Ruthenium-103	pCi/gram		<0.2		
Ruthenium-106	pCi/gram		<0.07		
Antimony-125	pCi/gram		<0.03		
Selenium (total)	ug/gram				<1.0

Test	Units	CPP33-01-R-3-2 02/08/91 13:20	CPP33-01-TX-1--1 02/08/91 13:00	CPP33-01-R-3-2 02/08/91 13:20	CPP33-01-TX-1--1 02/08/91 13:00
Silver (total)	ug/gram		0.8		<0.5
Arsenic (total)	ug/gram		3.5		3.1

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Test	Units	CPP33-01-R-3-2 02/08/91 13:20	CPP33-01-TX-1--1 02/08/91 13:00	CPP33-01-R-3-2 02/08/91 13:20	CPP33-01-TX-1--1 02/08/91 13:00
Barium (total)	ug/gram		71.8		10.2
Cadmium (total)	ug/gram		3.6		0.5
Cerium-144	pCi/gram	<0.05		<0.05	
Cobalt-58	pCi/gram	<0.09		<0.09	
Cobalt-60	pCi/gram	<0.07		<0.07	
Chromium (total)	ug/gram		15.7		2.4
Cesium-134	pCi/gram	<0.08		<0.08	
Mercury (total)	ug/gram		1.45		0.032
Iodine-129	pCi/gram	<0.5		<0.5	
Neptunium-237	pCi/gram	<0.5		<0.5	

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Test	Units	CPP33-01-R-3-2 02/08/91 13:20	CPP33-01-TX-1--1 02/08/91 13:00	CPP33-01-R-3-2 02/08/91 13:20	CPP33-01-TX-1--1 02/08/91 13:00
Lead (total)	ug/gram		9.2		1.7
pH	units		10.2		10.0
Percent solids	%	96	96	96	97
Ruthenium-103	pCi/gram	<0.2		<0.2	
Ruthenium-106	pCi/gram	<0.07		<0.07	
Antimony-125	pCi/gram	<0.03		<0.03	
Selenium (total)	ug/gram		<1.0		<1.2

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CEP, Inc. REPORT

Work Order # 91-02-253

Received: 02/13/91

05/10/91 16:01:33

Test	Units	CPP33-01-TX/R--7-4 02/08/91 14:15	CPP33-01-TX/R--9-5 02/08/91 14:40
Silver (total)	ug/gram	0.5	0.5
Arsenic (total)	ug/gram	2.6	4.4
Barium (total)	ug/gram	61.5	70.5
Cadmium (total)	ug/gram	3.0	3.8
Cerium-144	pCi/gram	<0.05	<0.05
Cobalt-58	pCi/gram	<0.09	<0.09
Cobalt-60	pCi/gram	<0.07	<0.07
Chromium (total)	ug/gram	12.5	14.5
Cesium-134	pCi/gram	<0.08	<0.08
Mercury (total)	ug/gram	0.15	0.13
Iodine-129	pCi/gram	<0.5	<0.5

Controls for Environmental Pollution, Inc.
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Test	Units	CPP33-01-TX/R--7-4 02/08/91 14:15	CPP33-01-TX/R--9-5 02/08/91 14:40
Neptunium-237	pCi/gram	<0.5	<0.5
Lead (total)	ug/gram	9.0	10.9
pH	units	9.54	11.5
Percent solids	%	93	93
Ruthenium-103	pCi/gram	<0.2	<0.2
Ruthenium-106	pCi/gram	<0.07	<0.07
Antimony-125	pCi/gram	<0.03	<0.03
Selenium (total)	ug/gram	<1.0	<1.0

Approved By: _____

Controls for Environmental Pollution, Inc.
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 CEP, Inc. REPORT Work Order # 91-02-253
Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-11-6 FRACTION 03A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 15:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	9.59+/-1.59

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-11-6 FRACTION 03A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 15:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	53.0+/-1.8

All results reported in:

UNITS pCi/gram

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Received: 02/13/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-11-6 FRACTION 03A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 15:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	<0.05
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-11-6 FRACTION 03A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 15:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.08+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.08+/-0.03

All results report in:

UNITS pCi/gram

CEP Controls for Environmental Pollution, Inc.
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 CEP, Inc. REPORT Work Order # 91-02-253
Received: 02/13/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-11-6 FRACTION 03A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/08/91 15:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	47.68+/-0.74*

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-5-3 FRACTION 04A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 13:50:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	2.91+/-2.02

All results reported in:

UNITS pCi/gram

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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-5-3 FRACTION Q4A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 13:50:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	<0.4

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-5-3 FRACTION Q4A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 13:50:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	0.06+/-0.04
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

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SAMPLE ID CPP33-01-TX/R-5-3 FRACTION 04A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 13:50:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.10+/-0.02
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.10+/-0.02

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-5-3 FRACTION 04A TEST CODE SR90 S NAME Strontium-90
Date & Time Collected 02/08/91 13:50:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	1.63+/-0.15

All results reported in:

UNITS pCi/gram

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SAMPLE ID CPP33-01-R-1-1 FRACTION 07A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	2.04+/-0.87

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-1-1 FRACTION 07A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	<0.4

All results reported in:

UNITS pCi/gram

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SAMPLE ID CPP33-01-R-1-1 FRACTION 07A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	0.46+/-0.14
Plutonium-239	0.05	0.34+/-0.12

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-1-1 FRACTION 07A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.09+/-0.02
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.09+/-0.03

All results report in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-02-253
Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-R-1-1 FRACTION 07A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	2.87+/-0.20

All results reported in:

UNITS pCi/gram

Controls for Environmental Pollution, Inc.
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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-R-1-1 FRACTION 10A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-1-1 FRACTION 10A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	<0.3

All results reported in:

UNITS pCi/gram

Controls for Environmental Pollution, Inc.
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Received: 02/13/91
Results by Sample

SAMPLE ID CPP33-01-R-1-1 FRACTION 10A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	<0.05
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-1-1 FRACTION 10A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.12+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.10+/-0.03

All results report in:

UNITS pCi/gram

Controls for Environmental Pollution, Inc.
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 CEP, Inc. REPORT Work Order # 91-02-253
Received: 02/13/91
Results by Sample

SAMPLE ID CPP33-01-R-1-1 FRACTION 10A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/08/91 13:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	0.59+/-0.12

All results reported in:

UNITS pCi/gram

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Results by Sample

SAMPLE ID CPP33-01-R-3-2 FRACTION 14A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-3-2 FRACTION 14A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	<0.4

All results reported in:

UNITS pCi/gram

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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-R-3-2 FRACTION 14A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	<0.05
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-3-2 FRACTION 14A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.15+/-0.05
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.13+/-0.04

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-3-2 FRACTION 14A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	0.35+/-0.10

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-3-2 FRACTION 16A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	<0.05

All results reported in:

UNITS pCi/gram

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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-R-3-2 FRACTION 16A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-3-2 FRACTION 16A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	0.55+/-0.13
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-R-3-2 FRACTION 16A TEST CODE ISOU 5 NAME Isotopic Uranium
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.11+/-0.02
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.12+/-0.02

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-01-R-3-2 FRACTION 16A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/08/91 13:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	201.8+/-1.5

All results reported in:

UNITS pCi/gram

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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-7-4 FRACTION 19A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 14:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-7-4 FRACTION 19A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 14:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	306+/-4

All results reported in:

UNITS pCi/gram

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Received: 02/13/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-7-4 FRACTION 19A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 14:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	<0.05
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-7-4 FRACTION 19A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 14:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.12+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.09+/-0.03

All results report in:

UNITS pCi/gram

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Received: 02/13/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-7-4 FRACTION 19A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/08/91 14:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	102.0+/-1.1

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-9-5 FRACTION 20A TEST CODE AM2415 NAME Americium-241
Date & Time Collected 02/08/91 14:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Americium-241	0.05	<0.05

All results reported in:

UNITS pCi/gram

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SAMPLE ID CPP33-01-TX/R-9-5 FRACTION 20A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/08/91 14:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	254+/-3

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-9-5 FRACTION 20A TEST CODE ISOPUS NAME Isotopic Plutonium
Date & Time Collected 02/08/91 14:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/L	RESULT
Plutonium-238	0.05	0.08+/-0.05
Plutonium-239	0.05	<0.05

All results reported in:

UNITS pCi/gram

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Received: 02/13/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-9-5 FRACTION 20A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/08/91 14:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.12+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.09+/-0.02

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-9-5 FRACTION 20A TEST CODE SR90 S NAME Strontium-90
Date & Time Collected 02/08/91 14:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	281.7+/-1.8

All results reported in:

UNITS pCi/gram

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Test Description	Result	D.L.	Units	Analyzed	By
Cadmium (total)	<0.001	0.001	mg/liter	03/07/91	JK
Chromium (total)	<0.01	0.01	mg/liter	03/06/91	NR
Lead (total)	0.002	0.001	mg/liter	03/06/91	JK
Mercury (total)	<0.0004	0.0004	mg/liter	03/04/91	JK
Selenium (total)	<0.01	0.01	mg/liter	03/04/91	JK
Silver (total)	<0.01	0.03	mg/liter	03/06/91	NR
pH	1.50		units	02/22/91	SKK

Sample: 10A CPP-33-01-R-0-EB Collected: 02/12/91 14:47

Test Description	Result	D.L.	Units	Analyzed	By
Americium-241	<1		pCi/liter		
Antimony-125	<10		pCi/liter		
Cerium-144	<18		pCi/liter		
Cesium-134	<8		pCi/liter		
Cesium-137	<10		pCi/liter		
Cobalt-58	<15		pCi/liter		
Cobalt-60	<9		pCi/liter		
Iodine-129	<5		pCi/liter		
Neptunium-237	<5		pCi/liter		
Plutonium-238	<0.6		pCi/liter		
Plutonium-239/240	<0.6		pCi/liter		
Ruthenium-103	<15		pCi/liter		
Ruthenium-106	<21		pCi/liter		
Strontium-90	3.0+/-2.1	0.5	pCi/liter		
Uranium-234	<0.6	0.6	pCi/liter		
Uranium-235	<0.6	0.6	pCi/liter		
Uranium-238	<0.6	0.6	pCi/liter		

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Golder Associates, Inc.
4104-148th Avenue, NE
Redmond, WA 98052

Attn: Kent Angelos

Work ID: Enviro., W.Q. & Organics
P O # :

Date Received: 02/18/91
Date Reported: 05/10/91
Work Order: 91-02-336
Category: CLP_CUSTODY

Test	Units	CPP33-01-V2-3-9-13-FD 02/13/91 15:00	CPP33-01-V2-3-9-13 02/13/91 15:00	CPP33-01-V2-3-7-12 02/13/91 14:10	CPP33-01-TX/R--37-12 02/13/91 14:10
Silver (total)	ug/gram				0.6
Americium-241	pCi/gram				<0.05
Arsenic (total)	ug/gram				5.2
Barium (total)	ug/gram				57.4
Cadmium (total)	ug/gram				4.3
Cerium-144	pCi/gram				<0.05
Cobalt-58	pCi/gram				<0.09
Cobalt-60	pCi/gram				<0.07

Environmental Evaluation, Inc.
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Received: 02/18/91

CEP, Inc. REPORT
05/10/91 16:18:32

Work Order # 91-02-336
Continued From Above

Test	Units	CPP33-01-V2-3-9-13-FD 02/13/91 15:00	CPP33-01-V2-3-9-13 02/13/91 15:00	CPP33-01-V2-3-7-12 02/13/91 14:10	CPP33-01-TX/R--37-12 02/13/91 14:10
Chromium (total)	ug/gram				12.5
Cesium-134	pCi/gram				<0.08
Mercury (total)	ug/gram				0.16
Iodine-129	pCi/gram				<0.2
Plutonium-239/240	pCi/gram				<0.05
Lead (total)	ug/gram				9.0
pH	units				9.58
Plutonium-238	pCi/gram				<0.05
Percent solids	%	81	78	92	94
Ruthenium-103	pCi/gram				<0.2

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Test	Units	CPP33-01-V2-3-9-13-FD 02/13/91 15:00	CPP33-01-V2-3-9-13 02/13/91 15:00	CPP33-01-V2-3-7-12 02/13/91 14:10	CPP33-01-TX/R--37-12 02/13/91 14:10
Ruthenium-106	pCi/gram				<0.07
Antimony-125	pCi/gram				<0.03
Selenium (total)	ug/gram				<1.0

Test	Units	CPP33-01-TX/R--39-13 02/13/91 15:00	CPP33-01-TX/R--39-13-FD 02/13/91 15:00	CPP33-01-TX/R--17-7 02/12/91 10:54	CPP33-01-TX/R--21-8 02/12/91 11:37
Silver (total)	ug/gram	0.6	0.6	0.5	0.5
Americium-241	pCi/gram	<0.05	<0.05	<0.05	<0.05
Arsenic (total)	ug/gram	4.6	5.5	3.9	4.2
Barium (total)	ug/gram	120	117	78.6	76.1

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Received: 02/18/91

CEP, Inc. REPORT
05/10/91 16:18:32

Work Order # 91-02-336
Continued From Above

Test	Units	CPP33-01-TX/R--39-13 02/13/91 15:00	CPP33-01-TX/R--39-13-FD 02/13/91 15:00	CPP33-01-TX/R--17-7 02/12/91 10:54	CPP33-01-TX/R--21-8 02/12/91 11:37
Cadmium (total)	ug/gram	6.8	6.8	4.6	4.7
Cerium-144	pCi/gram	<0.05	<0.05	<0.05	<0.05
Cobalt-58	pCi/gram	<0.09	<0.09	<0.09	<0.09
Cobalt-60	pCi/gram	<0.07	<0.07	<0.07	<0.07
Chromium (total)	ug/gram	26.4	26.6	15.1	16.3
Cesium-134	pCi/gram	<0.08	<0.08	<0.08	<0.08
Mercury (total)	ug/gram	0.10	0.13	0.09	0.13
Iodine-129	pCi/gram	<0.3	<0.8	<0.5	<0.5
Plutonium-239/240	pCi/gram	<0.05	<0.05	<0.05	<0.05
Lead (total)	ug/gram	16.2	15.0	11.5	10.5

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Received: 02/18/91

CEP, Inc. REPORT
05/10/91 16:18:32

Work Order # 91-02-336
Continued From Above

Test	Units	CPP33-01-TX/R--39-13 02/13/91 15:00	CPP33-01-TX/R--39-13-FD 02/13/91 15:00	CPP33-01-TX/R--17-7 02/12/91 10:54	CPP33-01-TX/R--21-B 02/12/91 11:37
pH	units	9.38	9.15	9.47	9.09
Plutonium-238	pCi/gram	<0.05	<0.05	<0.05	<0.05
Percent solids	%	83	88	96	92
Ruthenium-103	pCi/gram	<0.2	<0.2	<0.2	<0.2
Ruthenium-106	pCi/gram	<0.07	<0.07	<0.07	<0.07
Antimony-125	pCi/gram	<0.03	<0.03	<0.03	<0.03
Selenium (total)	ug/gram	<1.0	<1.0	<1.0	<1.0

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Received: 02/18/91 05/10/91 16:18:32

Test	Units	CPP33-01-TX/R--25-9 02/12/91 13:43	CPP33-01-TX/R--29-10 02/12/91 14:30	CPP33-01-TX/R--33-11 02/12/91 15:15	CPP33-01-V2-4-1-14 02/14/91 13:40
Silver (total)	ug/gram	0.5	0.6	0.5	
Americium-241	pCi/gram	<0.05	<0.05	<0.05	
Arsenic (total)	ug/gram	3.7	4.0	4.0	
Barium (total)	ug/gram	84.4	84.6	53.6	
Cadmium (total)	ug/gram	4.7	4.3	2.5	
Cerium-144	pCi/gram	<0.05	<0.05	<0.05	
Cobalt-58	pCi/gram	<0.09	<0.09	<0.09	
Cobalt-60	pCi/gram	<0.07	<0.07	<0.07	
Chromium (total)	ug/gram	15.5	14.7	9.4	
Cesium-134	pCi/gram	<0.08	<0.08	<0.08	
Mercury (total)	ug/gram	0.11	0.18	0.14	

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Received: 02/18/91

CEP, Inc. REPORT
05/10/91 16:18:32

Work Order # 91-02-336
Continued From Above

Test	Units	CPP33-01-TX/R--25-9 02/12/91 13:43	CPP33-01-TX/R--29-10 02/12/91 14:30	CPP33-01-TX/R--33-11 02/12/91 15:15	CPP33-01-V2-4-1-14 02/14/91 13:40
Iodine-129	pCi/gram	<0.8	<0.7	<0.8	
Plutonium-239/240	pCi/gram	<0.05	<0.05	<0.05	
Lead (total)	ug/gram	11.6	11.3	6.4	
pH	units	9.30	9.36	9.41	
Plutonium-238	pCi/gram	<0.05	<0.05	<0.05	
Percent solids	%	95	93	93	87
Ruthenium-103	pCi/gram	<0.2	<0.2	<0.2	
Ruthenium-106	pCi/gram	<0.07	<0.07	<0.07	
Antimony-125	pCi/gram	<0.03	<0.03	<0.03	
Selenium (total)	ug/gram	<1.0	<1.0	<1.0	

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Received: 02/18/91 05/10/91 16:18:32

Test	Units	CPP33-01-TX/R--41-14 02/14/91 13:40	CPP33-01-V2-4-5-15 02/14/91 14:30	CPP33-01-TX/R--45-15 02/14/91 14:30	CPP33-01-V2-4-7-16 02/14/91 15:20
Silver (total)	ug/gram	1.0		0.6	
Americium-241	pCi/gram	<0.05		0.39 0.24	
Arsenic (total)	ug/gram	4.2		4.1	
Barium (total)	ug/gram	138		163	
Cadmium (total)	ug/gram	8.2		9.3	
Cerium-144	pCi/gram	<0.05		<0.05	
Cobalt-58	pCi/gram	<0.09		<0.09	
Cobalt-60	pCi/gram	<0.07		<0.07	
Chromium (total)	ug/gram	32.1		33.6	
Cesium-134	pCi/gram	<0.08		<0.08	
Mercury (total)	ug/gram	0.23		0.11	

Environmental Protection, Inc.
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Test	Units	CPP33-01-TX/R--41-14 02/14/91 13:40	CPP33-01-V2-4-5-15 02/14/91 14:30	CPP33-01-TX/R--45-15 02/14/91 14:30	CPP33-01-V2-4-7-16 02/14/91 15:20
Iodine-129	pCi/gram	<0.8		<0.9	
Plutonium-239/240	pCi/gram	<0.05		<0.05	
Lead (total)	ug/gram	19.8		21.4	
pH	units	8.87		9.30	
Plutonium-238	pCi/gram	<0.05		<0.05	
Percent solids	%	87	83	84	84
Ruthenium-103	pCi/gram	<0.2		<0.2	
Ruthenium-106	pCi/gram	<0.07		<0.07	
Antimony-125	pCi/gram	<0.03		<0.03	
Selenium (total)	ug/gram	<1.0		<1.0	

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Received: 02/18/91 05/10/91 16:18:32

Test	Units	CPP33-01-TX/R--47-16 02/14/91 15:20
Silver (total)	ug/gram	0.5
Americium-241	pCi/gram	<0.05
Arsenic (total)	ug/gram	3.7
Barium (total)	ug/gram	152
Cadmium (total)	ug/gram	7.7
Cerium-144	pCi/gram	<0.05
Cobalt-58	pCi/gram	<0.09
Cobalt-60	pCi/gram	<0.07
Chromium (total)	ug/gram	29.0
Cesium-134	pCi/gram	<0.08
Mercury (total)	ug/gram	0.04

[illegible], Inc.
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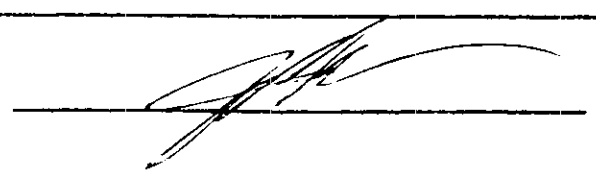
Received: 02/18/91

CEP, Inc. REPORT
05/10/91 16:18:32

Work Order # 91-02-336
Continued From Above

Test	Units	CPP33-01-TX/R--47-16 02/14/91 15:20
Iodine-129	pCi/gram	<0.3
Plutonium-239/240	pCi/gram	<0.05
Lead (total)	ug/gram	17.9
pH	units	9.08
Plutonium-238	pCi/gram	<0.05
Percent solids	%	85
Ruthenium-103	pCi/gram	<0.2
Ruthenium-106	pCi/gram	<0.07
Antimony-125	pCi/gram	<0.03
Selenium (total)	ug/gram	<1.0

Approved By: 

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 CEP, Inc. REPORT Work Order # 91-02-336
Received: 02/18/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-37-12 FRACTION 04A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/13/91 14:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	121+/-1

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-37-12 FRACTION 04A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/13/91 14:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	<0.05
Uranium-235	0.05	<0.05
Uranium-238	0.05	<0.05

All results report in:

UNITS pCi/gram

Controls for Environmental Pollution, Inc.
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 CEP, Inc. REPORT Work Order # 91-02-336
Received: 02/18/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-37-12 FRACTION Q4A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/13/91 14:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	1.14+/-0.60

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-37-12 FRACTION Q4A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/13/91 14:10:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	47.9+/-0.7

All results reported in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-02-336
Received: 02/18/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-39-13 FRACTION 05A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/13/91 15:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	0.42+/-0.07

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-39-13 FRACTION 05A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/13/91 15:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.28+/-0.09
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.30+/-0.09

All results report in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-02-336
Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-39-13 FRACTION 05A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/13/91 15:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-39-13 FRACTION 05A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/13/91 15:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	0.87+/-0.12

All results reported in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-39-13-FD FRACTION 06A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/13/91 15:00:00 Category WATER

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	3.82+/-0.59

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-39-13-FD FRACTION 06A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/13/91 15:00:00 Category WATER

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.11+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.16+/-0.04

All results report in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-39-13-FD FRACTION 06A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/13/91 15:00:00 Category WATER

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-39-13-FD FRACTION 06A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/13/91 15:00:00 Category WATER

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	1.88+/-0.16

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-17-7 FRACTION 08A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/12/91 10:54:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	219+/-3

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-17-7 FRACTION 08A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/12/91 10:54:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.10+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.13+/-0.04

All results report in:

UNITS pCi/gram

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SAMPLE ID CPP33-01-TX/R-17-7 FRACTION 08A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/12/91 10:54:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-17-7 FRACTION 08A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/12/91 10:54:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	328.8+/-1.8

All results reported in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-21-8 FRACTION 09A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/12/91 11:37:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	416+/-4

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-21-8 FRACTION 09A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/12/91 11:37:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.16+/-0.04
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.10+/-0.03

All results report in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-21-B FRACTION 09A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/12/91 11:37:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-21-B FRACTION 09A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/12/91 11:37:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	294.7+/-1.7

All results reported in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-25-9 FRACTION 10A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/12/91 13:43:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	606+/-3

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-25-9 FRACTION 10A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/12/91 13:43:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.13+/-0.02
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.11+/-0.02

All results report in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-02-336
Received: 02/18/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-25-9 FRACTION 10A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/12/91 13:43:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-25-9 FRACTION 10A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/12/91 13:43:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	163.5+/-1.3

All results reported in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-02-336
Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-29-10 FRACTION 11A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/12/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	29B+/-2

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-29-10 FRACTION 11A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/12/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.12+/-0.04
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.13+/-0.04

All results report in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-29-10 FRACTION 11A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/12/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.8

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-29-10 FRACTION 11A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/12/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	108.4+/-1.1

All results reported in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-33-11 FRACTION 12A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/12/91 15:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	10.3+/-0.4

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-33-11 FRACTION 12A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/12/91 15:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.18+/-0.04
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.26+/-0.04

All results report in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-33-11 FRACTION 12A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/12/91 15:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.5

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-33-11 FRACTION 12A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/12/91 15:15:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	6.0+/-0.3

All results reported in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-41-14 FRACTION 14A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/14/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	0.12+/-0.07

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-41-14 FRACTION 14A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/14/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.32+/-0.04
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.54+/-0.05

All results report in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-41-14 FRACTION 14A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/14/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	0.68+/-0.27

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-41-14 FRACTION 14A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/14/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	0.39+/-0.11

All results reported in:

UNITS pCi/gram

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SAMPLE ID CPP33-01-TX/R-45-15 FRACTION 16A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/14/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	2.37+/-0.15

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-45-15 FRACTION 16A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/14/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.17+/-0.03
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.18+/-0.04

All results report in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-45-15 FRACTION 16A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/14/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.6

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-45-15 FRACTION 16A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/14/91 14:30:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	2.5+/-0.2

All results reported in:

UNITS pCi/gram

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Received: 02/18/91 Results by Sample

SAMPLE ID CPP33-01-TX/R-47-16 FRACTION 18A TEST CODE CS1375 NAME Cesium-137
Date & Time Collected 02/14/91 15:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Cesium-137	0.1	2.13+/-0.07

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-47-16 FRACTION 18A TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 02/14/91 15:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.51+/-0.19
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.53+/-0.20

All results report in:

UNITS pCi/gram

Controls for Environmental Pollution, Inc.
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Received: 02/18/91
Results by Sample

SAMPLE ID CPP33-01-TX/R-47-16 FRACTION 18A TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 02/14/91 15:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.3

All results reported in:

UNITS pCi/gram

SAMPLE ID CPP33-01-TX/R-47-16 FRACTION 18A TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 02/14/91 15:20:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	<0.10

All results reported in:

UNITS pCi/gram

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Golder Associates, Inc.
4104-148th Avenue, NE
Redmond, WA 98052

Attn: Kent Angelos

Work ID: Soil
P O # :

Date Received: 03/05/91
Date Reported: 05/10/91
Work Order: 91-03-063
Category: CLP_CUSTODY

Test	Units	CPP33-1-113-MAT SPIKE 03/01/91 13:40	CPP33-1-113 03/01/91 13:40	CPP33-1-112 03/01/91 11:00
Silver (total)	ug/gram	0.7	0.7	0.7
Americium-241	pCi/gram	<0.05	<0.05	<0.05
Arsenic (total)	ug/gram	0.9	5.2	4.5
Barium (total)	ug/gram	146	145	147
Cadmium (total)	ug/gram	8.7	8.4	8.5
Cerium-144	pCi/gram	<0.05	<0.05	<0.05
Cobalt-58	pCi/gram	<0.09	<0.09	<0.09
Cobalt-60	pCi/gram	<0.07	<0.07	<0.07

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Test	Units	CPP33-1-113-MAT SPIKE 03/01/91 13:40	CPP33-1-113 03/01/91 13:40	CPP33-1-112 03/01/91 11:00
Chromium (total)	ug/gram	27.6	28.1	25.8
Cesium-134	pCi/gram	<0.08	<0.08	<0.08
Cesium-137	pCi/gram	<0.07	<0.08	<0.04
Mercury (total)	ug/gram	0.016	0.015	0.026
Iodine-129	pCi/gram	<0.07	<0.1	<0.1
Plutonium-239/240	pCi/gram	<0.05	<0.05	<0.05
Lead (total)	ug/gram	23.4	23.2	24.1
pH	units	9.74	9.73	9.53
Plutonium-238	pCi/gram	<0.05	<0.05	<0.05
Percent solids	%	76	76	76
Ruthenium-103	pCi/gram	<0.2	<0.2	<0.2

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CEP, Inc. REPORT

Work Order # 91-03-063

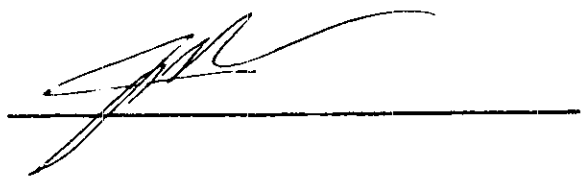
Received: 03/05/91

05/10/91 15:57:32

Continued From Above

Test	Units	CPP33-1-113-MAT SPIKE 03/01/91 13:40	CPP33-1-113 03/01/91 13:40	CPP33-1-112 03/01/91 11:00
Ruthenium-106	pCi/gram	<0.07	<0.07	<0.07
Antimony-125	pCi/gram	<0.03	<0.03	<0.03
Selenium (total)	ug/gram	0.34	0.59	0.39

* See QA package for matrix spike

Approved By: 

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Received: 03/05/91 Results by Sample

SAMPLE ID CPP33-1-113-MATRIX SPIKE FRACTION 01B TEST CODE ISOU S NAME Isotopic Uranium
Date & Time Collected 03/01/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.20+/-0.02
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.19+/-0.02

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-1-113-MATRIX SPIKE FRACTION 01B TEST CODE N237 S NAME Neptunium-237
Date & Time Collected 03/01/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.3

All results reported in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-03-063
Received: 03/05/91 Results by Sample

SAMPLE ID CPP33-1-113-MATRIX SPIKE FRACTION 01B TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 03/01/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	<0.03

All results reported in:

UNITS pCi/gram

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Received: 03/05/91 Results by Sample

SAMPLE ID CPP33-1-113 FRACTION 02B TEST CODE ISOU 5 NAME Isotopic Uranium
Date & Time Collected 03/01/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.20+/-0.02
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.19+/-0.02

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-1-113 FRACTION 02B TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 03/01/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	<0.4

All results reported in:

UNITS pCi/gram

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Page 11 CEP, Inc. REPORT Work Order # 91-03-063
Received: 03/05/91 Results by Sample

SAMPLE ID CPP33-1-113 FRACTION 02B TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 03/01/91 13:40:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	0.18+/-0.08

All results reported in:

UNITS pCi/gram

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Received: 03/05/91
Results by Sample

SAMPLE ID CPP33-1-112 FRACTION 03B TEST CODE ISOU 5 NAME Isotopic Uranium
Date & Time Collected 03/01/91 11:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/g	RESULT
Uranium-234	0.05	0.07+/-0.01
Uranium-235	0.05	<0.05
Uranium-238	0.05	0.05+/-0.01

All results report in:

UNITS pCi/gram

SAMPLE ID CPP33-1-112 FRACTION 03B TEST CODE N237 5 NAME Neptunium-237
Date & Time Collected 03/01/91 11:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Neptunium-237	0.05	0.38+/-0.17

All results reported in:

UNITS pCi/gram

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 CEP, Inc. REPORT Work Order # 91-03-063
Received: 03/05/91 Results by Sample

SAMPLE ID CPP33-1-112 FRACTION 03B TEST CODE SR90 5 NAME Strontium-90
Date & Time Collected 03/01/91 11:00:00 Category SOIL

Type of Analysis	Detection Limit pCi/gram	RESULT
Strontium-90	0.03	0.16+/-0.08

All results reported in:

UNITS pCi/gram

APPENDIX F

SAMPLE RESULTS
FOR ORGANIC ANALYSIS AS REPORTED BY THE LABORATORY
LAND DISPOSAL UNIT CPP-33, BOREHOLE 1

TABLE F-1

EXPLANATION OF ORGANIC RESULTS QUALIFIERS

U - Indicates the compound was analyzed for but not detected. The sample quantitation limit is the value listed and has been corrected for dilution and percent moisture. For soil samples subjected to GPC clean-up procedures, the sample quantitation limit is also multiplied by 2 to account for the fact that only half of the extract is recovered.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides $\geq$ 10 ng/μl in the final extract are to be confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag does <u>not</u> apply to pesticide/PCBs analyzed by GC methods.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is suspected to be an aldol-condensation product.

X - This flag identifies a specific flag required to properly define the results. When used they must be fully described in the associated case narrative.

ORGANIC DATA ASSESSMENT SUMMARY

PROJECT NO. 893-1195 SITE CPP33-01 (INEL)

LABORATORY CEP SAMPLES/MATRIX 17 Soils

7 Water (Trip + Equip. Blanks)

SDG # _____

DATA ASSESSMENT SUMMARY

		VOA	BNA	PEST	OTHER
1.	HOLDING TIMES	O			
2.	GC/MS TUNE/INSTR. PERFORM	O			
3.	CALIBRATIONS	O			
4.	BLANKS	O			
5.	SURROGATES	O			
6.	MATRIX SPIKE/DUP	O			
7.	OTHER QC	O			
8.	INTERNAL STANDARDS	O			
9.	COMPOUND IDENTIFICATION	O			
10.	SYSTEM PERFORMANCE	O			
11.	OVERALL ASSESSMENT	O			

O = Data had no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

NOTES: In 7. Cal. - $CHBr_3$ $\overline{RRF} < 0.250$, %RSD > 30 for Acetone + 2-Butanone

Data, as qualified, acceptable for use.

Validated by: Dennis K. Johnson Date: 5/24/91

Reviewed by: _____ Date: _____

SDG # CP933-01 Project No. 893-1195

	Acceptable YES	NO

1. Holding Times --- No C-O-C. - Cont'l lab

	Date Sampled	Analyzed	
1-1 thru 11-4	2/8/91	2/19 & 20/91	11 & 12 days ✓
17-7 thru 33-11	2/12/91	2/26/91	14 days ✓
37-12 thru 39-13	2/13/91	2/25/91	12 days ✓
41-14 thru 47-16	2/14/91	2/25/91	11 days ✓
112 & 113	3/1/91	3/6/91	5 days ✓

2. GC/MS Tuning --- ✓

OK, reveals 175/174, 176/174 & 177/176

no calc errors, No trans. errors

3. Calibration --- ✓

Reveals 'd for 1,1-Dichloroethene, Trichloroethene, 1,1,2,2-Tetrachloroethane on initial & Cont. Calib. – OK ✓ CBr_3H - RRF < 0.250 all $CHBr_3$ (R)

Cont. Calc: 2/19 - 9:27 Bromoform - 36.1%D / 2/20 - 8:35 CBr_3H - 32.6%D

2/25 - 8:55 $CHBr_3$ - 33.2 MIBK - 34.3 $CH_2Cl_2CHCl_2$ - 32.5 / 2/26 - 8:48 2-But.-60.3 Acet.-41.2

2/26 - 20:17 2-But - 37.6 / 3/06 - 11:03 2-But - 44.8 $CHBr_3$ - 35.2 MIBK - 31.6

4. Blanks ---

Field. ~~TB-2 - Acet. 4.5 MeCl2~~ Field Blanks – $MeCl_2$, Acetone, Chloroform, 2-Butanone – and 4 TICs

Lab Method Blanks – $MeCl_2$, Acetone, ~~Chloroform~~, and 5 TICs

5. Surrogate Recovery ---

TOLUENE d-8 out for 910253-18 (TB-1) 87%, 902336-07 (TB-4) 112%

6. Matrix Spike/Matrix Spike Duplicates --- ✓ (?)

MS/MSD OK – Lab used 80 ng of IS instead of 40 all %R's and RPDs are control.

7. Field Duplicates --- ✓

No detects in the field duplicate samples.

SDG # _____ Project No. _____

	Acceptable YES	NO
8. Internal Standards Performance	✓	

All relent. Times and IS areas within criteria

9. TCL Compound Identification	✓	

RRTs OK.

10. Compound Quant. and Reported Detection Limits	✓	

(?) OK - documentation (i.e., raw data) was not sufficient to permit calculation of reported results. See telecon memos 4/29 & 4/30/91 to Dave Martinez.

11. Tentatively Identified Compounds	✓	

Unknown TICs at 7.10, 16.7 and 20.7 RTs were also in the standards. ~~4/30~~

12. System Performance	✓	

No rising baseline, all peaks accounted for.

13. Overall Assessment	✓	

☒ Data acceptable for use as qualified

Golder Associates

TELECON/ CONTACT MEMORANDUM

☐ Personal Visit
☑ Telephone: ☐ Incoming ☑ Outgoing

ROUTE TO:
Files
☐ Project
☐ Business Development
☐ Mailing List

Company Name: CEP
Address: Santa Fe, NM
Person: Waverly Braunstein
Telephone: 800 - 545 - 2188
Job/subject: VOA Data Package

Job No. 893-1195.530
Date: 4/29/91
Time: 8:45

Remarks:

Advised Waverly that data package contained No C-O-C Forms. Said she would send them right away.

Asked her to have GC/MS analyst to call regarding specific analytical questions.

She will have David Martinez call me.

Action/Next Contact:

BY: Dennis R. Cheney

Golder Associates

TELECON/ CONTACT MEMORANDUM

☐ Personal Visit
☑ Telephone: ☑ Incoming ☐ Outgoing

ROUTE TO:
Files
☐ Project
☐ Business Development
☐ Mailing List

Company Name: CEP
Address:

Job No.

Person: David Martinez
Telephone: 800-545-2188
Job/subject: VOA quantitation

Date: 4/29/91
Time: 2:10

Remarks: What volume of standards are being purged?
10 ml

Are using 40 ug/l and 30 ug/l for IS and SS respectively?
That was how he was taught but is modifying to conform to SOW of 8240 (50 ug/l for both).

He will check Quant. formulas for both water and soil as form I values appear to be factor of 2 below what I calculated. He will get back to me on that.

Advised that he should be using daily calibration RRF instead of $\overline{RRF}$ for quantitation.

Action/Next Contact:
Await Call back. / Call again NLT 5/2/91

BY: Dennis Lohman

Golder Associates

TELECON/ CONTACT MEMORANDUM

☐ Personal Visit
☑ Telephone: ☑ Incoming ☐ Outgoing

ROUTE TO:
Files
☑ Project
☐ Business Development
☐ Mailing List

Company Name: CEP
Address:

Job No. 893-1195.530

Person: David Martinez
Telephone: 800-545-2188
Job/subject: VOA DATA PACKAGE

Date: 4/30/91
Time: 09:35

Remarks:

He advised that yes his Form I reported results were understated by factor of 2 due to internal formula in program. He will modify programs to correct.

He stated that for SOW's quant. value of internal standard should be 80 ug/kg (?) rather than 40. Values will not change.

I again advised that quant needs to be done using Daily Calibration RRF rather than Initial Calibration avg. RRF. He said he will revise report program to correct this problem.

Advised him to include in case narrative any deviations from method that lab is using.

Action/Next Contact:
None

BY: Dennis Robinson

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-TB-1
9102253-18

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102253-18

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB101

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. ____ Date Analyzed: 2/19/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene Chloride	1.	J	B
67-64-1	Acetone	6.		B
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene (total)	3.	U	
67-66-3	Chloroform	.6	J	
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	5.	U	X
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-TB-1
9102253-18

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102253-18

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB101

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/19/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.24	2.	J
2.	67630	2-Propanol (9CI)	10.15	3.	BJ
3.		Unknown hydrocarbon	16.67	1.	BJ
4.	110543	Hexane (8CI,9CI)	20.63	10.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP-33-01-TB2
9102253-11

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102253-11

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB109

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/19/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	5.	U	X
67-64-1	Acetone	4.	J	B
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	5.	U	X
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

00004

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
CPP33-01-TB-2
9102253-11

ab Name:CEP Contract:-------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

atrix: (soil/water) WATER Lab Sample ID: 9102253-11

ample wt/vol: 10 (g/mL) mL Lab File ID: >BB109

Level: (low/med) LOW Date Received: --------

Moisture: not dec.____ Date Analyzed: 2/19/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.16	3.	J
2.	67630	2-Propanol (9CI)	10.11	3.	BJ
3.		Unknown hydrocarbon	16.63	1.	BJ
4.	110543	Hexane (8CI9CI)	20.63	9.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-9-5
9102253-01

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-01

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB102

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 6 Date Analyzed: 2/19/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q	
74-87-3	Chloromethane	11.	U	
74-83-9	Bromomethane	11.	U	
75-01-4	Vinyl Chloride	11.	U	
75-00-3	Chloroethane	11.	U	
75-09-2	Methylene_Chloride	6.	B	
67-64-1	Acetone	13.	B	
75-15-0	Carbon Disulfide	5.	U	
75-35-4	1,1-Dichloroethene	5.	U	
75-34-3	1,1-Dichloroethane	5.	U	
540-59-0	1,2-Dichloroethene_(total)	5.	U	
67-66-3	Chloroform	1.	J	
107-02-2	1,2-Dichloroethane	5.	U	
78-93-3	2-Butanone	11.	U	
71-55-6	1,1,1-Trichloroethane	5.	U	
56-23-5	Carbon Tetrachloride	5.	U	
108-05-4	Vinyl Acetate	11.	U	
75-27-4	Bromodichloromethane	5.	U	
78-87-5	1,2-Dichloropropane	5.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	X
79-01-6	Trichloroethene	5.	U	
124-48-1	Dibromochloromethane	5.	U	
79-00-5	1,1,2-Trichloroethane	5.	U	
71-43-2	Benzene	5.	U	
10061-02-6	trans-1,3-Dichloropropene	5.	U	
75-25-2	Bromoform	5.	U	
108-10-1	4-Methyl-2-pentanone	11.	U	
591-78-6	2-Hexanone	11.	U	
127-18-4	Tetrachloroethene	5.	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	
108-88-3	Toluene	5.	U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
133-02-7	Xylene (total)	5.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-9-5
9102253-01

ab Name:CEP Contract:-------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-01

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB102

Level: (low/med) LOW Date Received: --------

Moisture: not dec.____ Date Analyzed: 2/19/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.12	6.	J
2.	6/630	2-Propanol (9CI)	10.15	5.	BJ
3.	110543	Hexane (8CI,9CI)	20.64	21.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
CPP33-01-82-1-1
9102253-06 02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-06 02

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB103

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.4 Date Analyzed: 2/19/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg		Q
74-87-3	Chloromethane	10.	U	
74-83-9	Bromomethane	10.	U	
75-01-4	Vinyl Chloride	10.	U	
75-00-3	Chloroethane	10.	U	
75-09-2	Methylene_Chloride	7.	B	
67-64-1	Acetone	10.	JB	
75-15-0	Carbon Disulfide	5.	U	
75-35-4	1,1-Dichloroethene	5.	U	
75-34-3	1,1-Dichloroethane	5.	U	
540-59-0	1,2-Dichloroethene_(total)	5.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	5.	U	
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	5.	U	
56-23-5	Carbon Tetrachloride	5.	U	
108-05-4	Vinyl Acetate	10.	U	
75-27-4	Bromodichloromethane	5.	U	
78-87-5	1,2-Dichloropropane	5.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	
79-01-6	Trichloroethene	5.	U	
124-48-1	Dibromochloromethane	5.	U	
79-00-5	1,1,2-Trichloroethane	5.	U	
71-43-2	Benzene	5.	U	
10061-02-6	trans-1,3-Dichloropropene	5.	U	
75-25-2	Bromoform	5.	U	
108-10-1	4-Methyl-2-pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	5.	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	
108-88-3	Toluene	5.	U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
133-02-7	Xylene (total)	5.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-1-1
9102253-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB103

Level: (low/med) LOW Date Received: --------

Moisture: not dec. 4 Date Analyzed: 2/19/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.11	6.	BJ
2.	110543	Hexane (8CI,9CI)	20.63	20.	BJ
3.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-3-2
9102253-06

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-06

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB104

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/19/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg		Q
74-87-3	Chloromethane	10.	U	
74-83-9	Bromomethane	10.	U	
75-01-4	Vinyl Chloride	10.	U	
75-00-3	Chloroethane	10.	U	
75-09-2	Methylene Chloride	8.	B	
67-64-1	Acetone	14.	B	
75-15-0	Carbon Disulfide	5.	U	
75-35-4	1,1-Dichloroethene	5.	U	
75-34-3	1,1-Dichloroethane	5.	U	
540-59-0	1,2-Dichloroethene (total)	5.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	5.	U	
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	5.	U	
56-23-5	Carbon Tetrachloride	5.	U	
108-05-4	Vinyl Acetate	10.	U	
75-27-4	Bromodichloromethane	5.	U	
78-87-5	1,2-Dichloropropane	5.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	
79-01-6	Trichloroethene	5.	U	
124-48-1	Dibromochloromethane	5.	U	
79-00-5	1,1,2-Trichloroethane	5.	U	
71-43-2	Benzene	5.	U	X
10061-02-6	trans-1,3-Dichloropropene	5.	U	
75-25-2	Bromoform	5.	U	
108-10-1	4-Methyl-2-pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	5.	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	
108-88-3	Toluene	5.	U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
133-02-7	Xylene (total)	5.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-3-2
9102253-06

Lab Name: LEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-06

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB104

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/19/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.16	5.	J
2.	67630	2-propanol (9CI)	10.15	6.	BJ
3.		Unknown hydrocarbon	16.63	3.	BJ
4.	110543	Hexane (8CI9CI)	20.63	21.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-12-7-4
9102253-08

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-08

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB108

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/20/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg		Q
74-87-3	Chloromethane	10.	U	
74-83-9	Bromomethane	10.	U	
75-01-4	Vinyl Chloride	10.	U	
75-00-3	Chloroethane	10.	U	
75-09-2	Methylene_Chloride	3.	J	
67-64-1	Acetone	19.	B	
75-15-0	Carbon Disulfide	5.	U	
75-35-4	1,1-Dichloroethene	5.	U	
75-34-3	1,1-Dichloroethane	5.	U	
540-59-0	1,2-Dichloroethene_(total)	5.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	5.	U	
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	5.	U	
56-23-5	Carbon Tetrachloride	5.	U	
108-05-4	Vinyl Acetate	10.	U	
75-27-4	Bromodichloromethane	5.	U	
78-87-5	1,2-Dichloropropane	5.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	
79-01-6	Trichloroethene	1.	J	
124-48-1	Dibromochloromethane	5.	U	
79-00-5	1,1,2-Trichloroethane	5.	U	
71-43-2	Benzene	5.	U	
10061-02-6	trans-1,3-Dichloropropene	5.	U	
75-25-2	Bromoform	5.	U	
108-10-1	4-Methyl-2-pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	5.	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	
108-88-3	Toluene	5.	U	X
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
133-02-7	Xylene (total)	5.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-7-4
9102253-08

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-08

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB108

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/20/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.16	6.	J
2.	6/630	2-Propanol (9CI)	10.11	12.	BJ
3.		Unknown hydrocarbon	16.68	3.	BJ
4.	110543	Hexane (8CI9CI)	20.64	24.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-5-3
9102253-09

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-09

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB110

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/20/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg		Q
74-87-3	Chloromethane	10.	U	
74-83-9	Bromomethane	10.	U	
75-01-4	Vinyl Chloride	10.	U	
75-00-3	Chloroethane	10.	U	
75-09-2	Methylene Chloride	2.	J	
67-64-1	Acetone	14.	B	
75-15-0	Carbon Disulfide	5.	U	
75-35-4	1,1-Dichloroethene	5.	U	
75-34-3	1,1-Dichloroethane	5.	U	
540-59-0	1,2-Dichloroethene (total)	5.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	5.	U	
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	5.	U	
56-23-5	Carbon Tetrachloride	5.	U	
108-05-4	Vinyl Acetate	10.	U	
75-27-4	Bromodichloromethane	5.	U	
78-87-5	1,2-Dichloropropane	5.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	X
79-01-6	Trichloroethene	5.	U	
124-48-1	Dibromochloromethane	5.	U	
79-00-5	1,1,2-Trichloroethane	5.	U	
71-43-2	Benzene	5.	U	
10061-02-6	trans-1,3-Dichloropropene	5.	U	
75-25-2	Bromoform	5.	U	
108-10-1	4-Methyl-2-pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	5.	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	
108-88-3	Toluene	5.	U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
133-02-7	Xylene (total)	5.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-5-3
9102253-09

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-09

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB110

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/20/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.35	5.	J
2.	67630	2-Propanol (9CI)	10.19	6.	BJ
3.	110543	Hexane (8CI9CI)	20.67	20.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-c1-V2-11-6
9102253-12

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-12

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB111

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.1 Date Analyzed: 2/20/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg		Q
74-87-3	Chloromethane	10.	U	
74-83-9	Bromomethane	10.	U	
75-01-4	Vinyl Chloride	10.	U	
75-00-3	Chloroethane	10.	U	
75-09-2	Methylene_Chloride	2.	J	
67-64-1	Acetone	9.	J B	
75-15-0	Carbon Disulfide	5.	U	
75-35-4	1,1-Dichloroethene	5.	U	
75-34-3	1,1-Dichloroethane	5.	U	
540-59-0	1,2-Dichloroethene_(total)	5.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	5.	U	
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	5.	U	
56-23-5	Carbon Tetrachloride	5.	U	
108-05-4	Vinyl Acetate	10.	U	
75-27-4	Bromodichloromethane	5.	U	
78-87-5	1,2-Dichloropropane	5.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	X
79-01-6	Trichloroethene	5.	U	
124-48-1	Dibromochloromethane	5.	U	
79-00-5	1,1,2-Trichloroethane	5.	U	
71-43-2	Benzene	5.	U	
10061-02-6	trans-1,3-Dichloropropene	5.	U	
75-25-2	Bromoform	5.	U	
108-10-1	4-Methyl-2-pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	5.	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	
108-88-3	Toluene	5.	U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
133-02-7	Xylene (total)	5.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-11-6
9102253-12

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102253-12

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB111

Level: (low/med) LOW Date Received: --------

Moisture: not dec.1 Date Analyzed: 2/20/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.15	5.	BJ
2.	110543	Hexane (8CI9CI)	20.63	19.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-TB-4
9102336-07

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102336-07

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB124

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene Chloride	.5	J	
67-64-1	Acetone	11.	B	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene (total)	3.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	3.	U	
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-TB-4
9102336-07

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102336-07

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB124

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.99	4.	BJ
2.	67630	2-Propanol (YCI)	10.14	9.	BJ
3.		Unknown hydrocarbon	16.70	1.	BJ
4.	110543	Hexane (8CI9CI)	20.66	10.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-TB-5
9102336-19

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102336-19

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB125

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	5.	U	X
67-64-1	Acetone	5.	B	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	3.	U	
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	3.	U	
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
CPP33-01-TB-5
9102336-19

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-19

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB125

Level: (low/med) LOW Date Received: --------

Moisture: not dec. 19 Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.15	14.	BJ
2.		Unknown hydrocarbon	16.67	3.	BJ
3.	110543	Hexane (8CI9CI)	20.67	24.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
CPP33-01-V2-39-13-FD
9102336-01

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-01

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB126

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 19 Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	12.	U
74-83-9	Bromomethane	12.	U
75-01-4	Vinyl Chloride	12.	U
75-00-3	Chloroethane	12.	U
75-09-2	Methylene Chloride	4.	J
67-64-1	Acetone	32.	B
75-15-0	Carbon Disulfide	6.	U
75-35-4	1,1-Dichloroethene	6.	U
75-34-3	1,1-Dichloroethane	6.	U
540-59-0	1,2-Dichloroethene (total)	6.	U
67-66-3	Chloroform	6.	U
107-02-2	1,2-Dichloroethane	6.	U
78-93-3	2-Butanone	12.	U
71-55-6	1,1,1-Trichloroethane	6.	U
56-23-5	Carbon Tetrachloride	6.	U
108-05-4	Vinyl Acetate	12.	U
75-27-4	Bromodichloromethane	6.	U
78-87-5	1,2-Dichloropropane	6.	U
10061-01-5	cis-1,3-Dichloropropene	6.	U
79-01-6	Trichloroethene	6.	U
124-48-1	Dibromochloromethane	6.	U
79-00-5	1,1,2-Trichloroethane	6.	U
71-43-2	Benzene	6.	U
10061-02-6	trans-1,3-Dichloropropene	6.	U
75-25-2	Bromoform	6.	U
108-10-1	4-Methyl-2-pentanone	12.	U
591-78-6	2-Hexanone	12.	U
127-18-4	Tetrachloroethene	6.	U
79-34-5	1,1,2,2-Tetrachloroethane	6.	U
108-88-3	Toluene	6.	U
108-90-7	Chlorobenzene	6.	U
100-41-4	Ethylbenzene	6.	U
100-42-5	Styrene	6.	U
133-02-7	Xylene (total)	6.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-39-134FD
9102336-01

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-01

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB126

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 19 Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.10	6.	BJ
2.	67-63-0	2-propanol (9CI)	10.12	14.	BJ
3.		Unknown hydrocarbon	16.69	3.	BJ
4.	110-54-3	Hexane (8CI,9CI)	20.69	24.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-39-13-RD 9102336-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB127

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.22 Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	13.	U
74-83-9	Bromomethane	13.	U
75-01-4	Vinyl Chloride	13.	U
75-00-3	Chloroethane	13.	U
75-09-2	Methylene Chloride	4.	J
67-64-1	Acetone	15.	B
75-15-0	Carbon Disulfide	6.	U
75-35-4	1,1-Dichloroethene	6.	U
75-34-3	1,1-Dichloroethane	6.	U
540-59-0	1,2-Dichloroethene (total)	6.	U
67-66-3	Chloroform	6.	U
107-02-2	1,2-Dichloroethane	6.	U
78-93-3	2-Butanone	13.	U
71-55-6	1,1,1-Trichloroethane	6.	U
56-23-5	Carbon Tetrachloride	6.	U
108-05-4	Vinyl Acetate	13.	U
75-27-4	Bromodichloromethane	6.	U
78-87-5	1,2-Dichloropropane	6.	U
10061-01-5	cis-1,3-Dichloropropene	6.	U
79-01-6	Trichloroethene	6.	U
124-48-1	Dibromochloromethane	6.	U
79-00-5	1,1,2-Trichloroethane	6.	U
71-43-2	Benzene	6.	U
10061-02-6	trans-1,3-Dichloropropene	6.	U
75-25-2	Bromoform	6.	U
108-10-1	4-Methyl-2-pentanone	13.	U
591-78-6	2-Hexanone	13.	U
127-18-4	Tetrachloroethene	6.	U
79-34-5	1,1,2,2-Tetrachloroethane	6.	U
108-88-3	Toluene	6.	U
108-90-7	Chlorobenzene	6.	U
100-41-4	Ethylbenzene	6.	U
100-42-5	Styrene	6.	U
133-02-7	Xylene (total)	6.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CP33-01-V2-39-131-BS 10C
9102336-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB127

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 22 Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.14	5.	BJ
2.	67630	2-Propanol (9CI)	10.17	16.	BJ
3.		Unknown hydrocerbon	16.73	3.	BJ
4.	110543	Hexane (8CI9CI)	20.70	24.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
CPP33-01-V2-37-12
9102336-03

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-03

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB128

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 8 Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11.	U
74-83-9	Bromomethane	11.	U
75-01-4	Vinyl Chloride	11.	U
75-00-3	Chloroethane	11.	U
75-09-2	Methylene_Chloride	3.	J
67-64-1	Acetone	22.	B
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene_(total)	5.	U
67-66-3	Chloroform	5.	U
107-02-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	11.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	11.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	11.	U
591-78-6	2-Hexanone	11.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
CPP33-01-V2-37-1a
9102336-03

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-03

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB128

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 8 Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.15	13.	BJ
2.		Unknown hydrocarbon	16.71	2.	BJ
3.	110543	Hexane (8CI9CI)	20.67	20.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-4H-1
9102336-13

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-13

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB129

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 13 Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11.	U
74-83-9	Bromomethane	11.	U
75-01-4	Vinyl Chloride	11.	U
75-00-3	Chloroethane	11.	U
75-09-2	Methylene Chloride	4.	J
67-64-1	Acetone	21.	B
75-15-0	Carbon Disulfide	6.	U
75-35-4	1,1-Dichloroethene	6.	U
75-34-3	1,1-Dichloroethane	6.	U
540-59-0	1,2-Dichloroethene (total)	6.	U
67-66-3	Chloroform	6.	U
107-02-2	1,2-Dichloroethane	6.	U
78-93-3	2-Butanone	11.	U
71-55-6	1,1,1-Trichloroethane	6.	U
56-23-5	Carbon Tetrachloride	6.	U
108-05-4	Vinyl Acetate	11.	U
75-27-4	Bromodichloromethane	6.	U
78-87-5	1,2-Dichloropropane	6.	U
10061-01-5	cis-1,3-Dichloropropene	6.	U
79-01-6	Trichloroethene	6.	U
124-48-1	Dibromochloromethane	6.	U
79-00-5	1,1,2-Trichloroethene	6.	U
71-43-2	Benzene	6.	U
10061-02-6	trans-1,3-Dichloropropene	6.	U
75-25-2	Bromoform	6.	U
108-10-1	4-Methyl-2-pentanone	11.	U
591-78-6	2-Hexanone	11.	U
127-18-4	Tetrachloroethene	6.	U
79-34-5	1,1,2,2-Tetrachloroethane	6.	U
108-88-3	Toluene	6.	U
108-90-7	Chlorobenzene	6.	U
100-41-4	Ethylbenzene	6.	U
100-42-5	Styrene	6.	U
133-02-7	Xylene (total)	6.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-H-14
9102336-13

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-13

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB129

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 13 Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.11	14.	BJ
2.		Unknown hydrocarbon	16.67	3.	BJ
3.	110543	Hexane (8CI9CI)	20.67	24.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
CPP33-01-V2-45-15
9102336-15

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-15

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB130

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 17 Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	12.	U
74-83-9	Bromomethane	12.	U
75-01-4	Vinyl Chloride	12.	U
75-00-3	Chloroethane	12.	U
75-09-2	Methylene Chloride	8.	
67-64-1	Acetone	27.	B
75-15-0	Carbon Disulfide	6.	U
75-35-4	1,1-Dichloroethene	6.	U
75-34-3	1,1-Dichloroethane	6.	U
540-59-0	1,2-Dichloroethene (total)	6.	U
67-66-3	Chloroform	6.	U
107-02-2	1,2-Dichloroethane	6.	U
78-93-3	2-Butanone	12.	U
71-55-6	1,1,1-Trichloroethane	6.	U
56-23-5	Carbon Tetrachloride	6.	U
108-05-4	Vinyl Acetate	12.	U
75-27-4	Bromodichloromethane	6.	U
78-87-5	1,2-Dichloropropane	6.	U
10061-01-5	cis-1,3-Dichloropropene	6.	U
79-01-6	Trichloroethene	6.	U
124-48-1	Dibromochloromethane	6.	U
79-00-5	1,1,2-Trichloroethane	6.	U
71-43-2	Benzene	6.	U
10061-02-6	trans-1,3-Dichloropropene	6.	U
75-25-2	Bromoform	6.	U
108-10-1	4-Methyl-2-pentanone	12.	U
591-78-6	2-Hexanone	12.	U
127-18-4	Tetrachloroethene	6.	U
79-34-5	1,1,2,2-Tetrachloroethane	6.	U
108-88-3	Toluene	6.	U
108-90-7	Chlorobenzene	6.	U
100-41-4	Ethylbenzene	6.	U
100-42-5	Styrene	6.	U
133-02-7	Xylene (total)	6.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
LPP33-01-V2-45-15
9102336-15

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-15

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB130

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 17 Date Analyzed: 2/25/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.04	6.	BJ
2.	67630	2-Propanol (9CI)	10.11	13.	BJ
3.		Unknown hydrocarbon	16.67	4.	BJ
4.	110543	Hexane (8CI9CI)	20.67	35.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-VA-47-16
9102336-17

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-17

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB134

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 16 Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	12.	U
74-83-9	Bromomethane	12.	U
75-01-4	Vinyl Chloride	12.	U
75-00-3	Chloroethane	12.	U
75-09-2	Methylene_Chloride	4.	JB
67-64-1	Acetone	19.	B
75-15-0	Carbon Disulfide	6.	U
75-35-4	1,1-Dichloroethene	6.	U
75-34-3	1,1-Dichloroethane	6.	U
540-59-0	1,2-Dichloroethene_(total)	6.	U
67-66-3	Chloroform	6.	U
107-02-2	1,2-Dichloroethane	6.	U
78-93-3	2-Butanone	12.	U
71-55-6	1,1,1-Trichloroethane	6.	U
56-23-5	Carbon Tetrachloride	6.	U
108-05-4	Vinyl Acetate	12.	U
75-27-4	Bromodichloromethane	6.	U
78-87-5	1,2-Dichloropropane	6.	U
10061-01-5	cis-1,3-Dichloropropene	6.	U
79-01-6	Trichloroethene	6.	U
124-48-1	Dibromochloromethane	6.	U
79-00-5	1,1,2-Trichloroethane	6.	U
71-43-2	Benzene	6.	U
10061-02-6	trans-1,3-Dichloropropene	6.	U
75-25-2	Bromoform	6.	U
108-10-1	4-Methyl-2-pentanone	12.	U
591-78-6	2-Hexanone	12.	U
127-18-4	Tetrachloroethene	6.	U
79-34-5	1,1,2,2-Tetrachloroethene	6.	U
108-88-3	Toluene	6.	U
108-90-7	Chlorobenzene	6.	U
100-41-4	Ethylbenzene	6.	U
100-42-5	Styrene	6.	U
133-02-7	Xylene (total)	6.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPF33-01-VA-47-16
9102336-17

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102336-17

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB134

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 16 Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.98	11.	BJ
2.	67630	2-Propanol (9CI)	10.13	22.	BJ
3.		Unknown hydrocarbon	16.69	3.	BJ
4.	110543	Hexane (8CI9CI)	20.65	28.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-17-7
9102283-01

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-01

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB137

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 4 Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	3.	J B
67-64-1	Acetone	11.	B
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-02-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethene	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-17-7
9102283-01

La Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Ma rix: (soil/water) SOIL Lab Sample ID: 9102283-01

Sa ple wt/vol: 5 (g/mL) G Lab File ID: >BB137

Level: (low/med) LOW Date Received: --------

% loisture: not dec.4 Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.02	5.	BJ
2.	67630	2-Propanol (9CI)	10.17	15.	BJ
3.		Unknown hydrocarbon	16.69	3.	BJ
4.	110543	Hexane (8CI9CI)	20.69	20.	BJ
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7.					
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9.					
0.					
1.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-21-8
9102283-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB138

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 7 Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11.	U
74-83-9	Bromomethane	11.	U
75-01-4	Vinyl Chloride	11.	U
75-00-3	Chloroethane	11.	U
75-09-2	Methylene Chloride	3.	JB
67-64-1	Acetone	19.	B
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-02-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	11.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	11.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	11.	U
591-78-6	2-Hexanone	11.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33 01-Y2-21-8
9102283-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB138

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 7 Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.42	16.	BJ
2.		Unknown hydrocarbon	17.02	2.	BJ
3.	110543	Hexane (8CI9CI)	21.02	20.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-25-9
9102283-03

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-03

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB139

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 7 Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11.	U
74-83-9	Bromomethane	11.	U
75-01-4	Vinyl Chloride	11.	U
75-00-3	Chloroethane	11.	U
75-09-2	Methylene Chloride	3.	JB
67-64-1	Acetone	25.	B
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-02-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	11.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	11.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	11.	U
591-78-6	2-Hexanone	11.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-V2-25-9
9102283-03

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-03

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB139

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 7 Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	10.15	17.	BJ
2.	67630	2-Propenol (9CI)	16.68	2.	BJ
3.	110543	Hexane (8CI9CI)	20.67	21.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-29-10
9102283-04

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-04

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB140

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 8 Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11.	U
74-83-9	Bromomethane	11.	U
75-01-4	Vinyl Chloride	11.	U
75-00-3	Chloroethane	11.	U
75-09-2	Methylene_Chloride	3.	JB
67-64-1	Acetone	17.	B
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene_(total)	5.	U
67-66-3	Chloroform	5.	U
107-02-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	11.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	11.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	11.	U
591-78-6	2-Hexanone	11.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
CPP33-01-V2-29-10
9102283-04

L b Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

M trix: (soil/water) SOIL Lab Sample ID: 9102283-04

S mple wt/vol: 5 (g/mL) G Lab File ID: >BB140

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.8 Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	10.15	16.	BJ
2.	67630	2-Propanol (9CI)	16.67	2.	BJ
3.	110543	Hexane (8CI9CI)	20.67	22.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-33-11
9102283-05

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-05

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB141

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 5 Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	11.	U
74-83-9	Bromomethane	11.	U
75-01-4	Vinyl Chloride	11.	U
75-00-3	Chloroethane	11.	U
75-09-2	Methylene Chloride	3.	J B
67-64-1	Acetone	18.	B
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-02-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	11.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	11.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	11.	U
591-78-6	2-Hexanone	11.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-VA-33-11
9102283-05

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9102283-05

Sample wt/vol: 5 (g/mL) G Lab File ID: >BB141

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 5 Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.08	4.	BJ
2.	67630	2-Propanol (9CI)	10.15	15.	BJ
3.		Unknown hydrocarbon	16.71	2.	BJ
4.	110543	Hexane (8CI9CI)	20.67	22.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-TB-3
9102283-06

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102283-06

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB145

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	5.	U	X
67-64-1	Acetone	4.	JB	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	3.	U	
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	3.	U	
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-01-TB-3
9102283-06

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102283-06

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB145

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.08	3.	BJ
2.	67630	2-Propanol (9CI)	10.15	8.	BJ
3.		Unknown hydrocarbon	16.71	1.	BJ
4.	110543	Hexane (8CI9CI)	20.67	10.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-01-V2-0-EB
9102283-07

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102283-07

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB146

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	5.	U	X
67-64-1	Acetone	48.	B	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	3.	U	
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	7.		
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	5.	U	X
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
CPP33-01-TX-0-EB
9102283-07

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9102283-07

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB146

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.16	9.	BJ
2.		Unknown hydrocarbon	16.72	1.	BJ
3.	110543	Hexane (8CI9CI)	20.69	10.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
CPP33-1-TB
9103063-04

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9103063-04

Sample wt/vol: 10 (g/mL) mL Lab File ID: >CB022

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. ____ Date Analyzed: 3/06/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U
74-83-9	Bromomethane	5.	U
75-01-4	Vinyl Chloride	5.	U
75-00-3	Chloroethane	5.	U
75-09-2	Methylene Chloride	1.	J B
67-64-1	Acetone	4.	J B
75-15-0	Carbon Disulfide	3.	U
75-35-4	1,1-Dichloroethene	3.	U
75-34-3	1,1-Dichloroethane	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U
67-66-3	Chloroform	3.	U
107-02-2	1,2-Dichloroethane	3.	U
78-93-3	2-Butanone	5.	U
71-55-6	1,1,1-Trichloroethane	3.	U
56-23-5	Carbon Tetrachloride	3.	U
108-05-4	Vinyl Acetate	5.	U
75-27-4	Bromodichloromethane	3.	U
78-87-5	1,2-Dichloropropane	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U
79-01-6	Trichloroethene	3.	U
124-48-1	Dibromochloromethane	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U
71-43-2	Benzene	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U
75-25-2	Bromoform	3.	U
108-10-1	4-Methyl-2-pentanone	5.	U
591-78-6	2-Hexanone	5.	U
127-18-4	Tetrachloroethene	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U
108-88-3	Toluene	3.	U
108-90-7	Chlorobenzene	3.	U
100-41-4	Ethylbenzene	3.	U
100-42-5	Styrene	3.	U
133-02-7	Xylene (total)	3.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CPP33-1-TB
9103063-04

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: 9103063-04

Sample wt/vol: 10 (g/mL) mL Lab File ID: >CB022

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. ____ Date Analyzed: 3/06/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.05	3.	BJ
2.	67630	2-Propanol (9CI)	10.16	6.	BJ
3.	110543	Hexane (8CI9CI)	20.72	5.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-1-113
9103063-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9103063-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >CB023

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 24 Date Analyzed: 3/06/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	13.	U
74-83-9	Bromomethane	13.	U
75-01-4	Vinyl Chloride	13.	U
75-00-3	Chloroethane	13.	U
75-09-2	Methylene Chloride	6.	JB
67-64-1	Acetone	18.	B
75-15-0	Carbon Disulfide	7.	U
75-35-4	1,1-Dichloroethene	7.	U
75-34-3	1,1-Dichloroethane	7.	U
540-59-0	1,2-Dichloroethene (total)	7.	U
67-66-3	Chloroform	7.	U
107-02-2	1,2-Dichloroethane	7.	U
78-93-3	2-Butanone	13.	U
71-55-6	1,1,1-Trichloroethane	7.	U
56-23-5	Carbon Tetrachloride	7.	U
108-05-4	Vinyl Acetate	13.	U
75-27-4	Bromodichloromethane	7.	U
78-87-5	1,2-Dichloropropane	7.	U
10061-01-5	cis-1,3-Dichloropropene	7.	U
79-01-6	Trichloroethene	7.	U
124-48-1	Dibromochloromethane	7.	U
79-00-5	1,1,2-Trichloroethane	7.	U
71-43-2	Benzene	7.	U
10061-02-6	trans-1,3-Dichloropropene	7.	U
75-25-2	Bromoform	7.	U
108-10-1	4-Methyl-2-pentanone	13.	U
591-78-6	2-Hexanone	13.	U
127-18-4	Tetrachloroethene	7.	U
79-34-5	1,1,2,2-Tetrachloroethane	7.	U
108-88-3	Toluene	7.	U
108-90-7	Chlorobenzene	7.	U
100-41-4	Ethylbenzene	7.	U
100-42-5	Styrene	7.	U
133-02-7	Xylene (total)	7.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
LPP33-1-113
9103063-02

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9103063-02

Sample wt/vol: 5 (g/mL) G Lab File ID: >CB023

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 24 Date Analyzed: 3/06/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.08	5.	BJ
2.	67630	2-Propanol (9CI)	10.15	23.	BJ
3.	110543	Hexane (8CI9CI)	20.71	13.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CPP33-1-112
9103063-03

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9103063-03

Sample wt/vol: 5 (g/mL) G Lab File ID: >CB024

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 24 Date Analyzed: 3/06/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
74-87-3	Chloromethane	13.	U
74-83-9	Bromomethane	13.	U
75-01-4	Vinyl Chloride	13.	U
75-00-3	Chloroethane	13.	U
75-09-2	Methylene Chloride	7.	B
67-64-1	Acetone	39.	B
75-15-0	Carbon Disulfide	7.	U
75-35-4	1,1-Dichloroethene	7.	U
75-34-3	1,1-Dichloroethane	7.	U
540-59-0	1,2-Dichloroethene (total)	7.	U
67-66-3	Chloroform	7.	U
107-02-2	1,2-Dichloroethane	7.	U
78-93-3	2-Butanone	13.	U
71-55-6	1,1,1-Trichloroethane	7.	U
56-23-5	Carbon Tetrachloride	7.	U
108-05-4	Vinyl Acetate	13.	U
75-27-4	Bromodichloromethane	7.	U
78-87-5	1,2-Dichloropropane	7.	U
10061-01-5	cis-1,3-Dichloropropene	7.	U
79-01-6	Trichloroethene	7.	U
124-48-1	Dibromochloromethane	7.	U
79-00-5	1,1,2-Trichloroethane	7.	U
71-43-2	Benzene	7.	U
10061-02-6	trans-1,3-Dichloropropene	7.	U
75-25-2	Bromoform	7.	U
108-10-1	4-Methyl-2-pentanone	13.	U
591-78-6	2-Hexanone	13.	U
127-18-4	Tetrachloroethene	7.	U
79-34-5	1,1,2,2-Tetrachloroethane	7.	U
108-88-3	Toluene	7.	U
108-90-7	Chlorobenzene	7.	U
100-41-4	Ethylbenzene	7.	U
100-42-5	Styrene	7.	U
133-02-7	Xylene (total)	7.	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
CPP33-1-112
9103063-03

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) SOIL Lab Sample ID: 9103063-03

Sample wt/vol: 5 (g/mL) G Lab File ID: >CB024

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. 24 Date Analyzed: 3/06/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.14	6.	BJ
2.	67630	2-Propanol (9CI)	10.17	23.	BJ
3.	110543	Hexane (8CI9CI)	20.73	14.	BJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAA

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAA

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB099

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/19/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	1.	J	
67-64-1	Acetone	5.	J	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	X
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	10.	U	X
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	5.	U	X
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKAA

ab Name:LEP Contract:-------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

atrix: (soil/water) WATER Lab Sample ID: VBLKAA

ample wt/vol: 10 (g/mL) mL Lab File ID: >BB099

Level: (low/med) LOW Date Received: --------

Moisture: not dec.____ Date Analyzed: 2/19/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.11	3.	J
2.		Unknown hydrocarbon	16.67	1.	J
3.	110543	Hexane (8CI9CI)	20.63	11.	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAB

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAB

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB107

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. ____ Date Analyzed: 2/20/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	5.	U	X
67-64-1	Acetone	7.	B	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	X
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	3.	U	
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
VBLKAB

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAB

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB107

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/20/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	67630	2-Propanol (9CI)	10.13	4.	J
2.		Unknown hydrocarbon	16.65	1.	J
3.	110543	Hexane (8CI9CI)	20.65	10.	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAC

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAC

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB114

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/21/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	5.	U	X
67-64-1	Acetone	6.		
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	5.	U	X
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	3.	U	
79-01-6	Trichloroethene	3.	U	
124-48-1	Dibromochloromethane	3.	U	
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	5.	U	
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	3.	U	
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKAC

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAC

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB114

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/21/91

Column: PACK Dilution Factor: 1.000000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.08	3.	J
2.	67630	2-Propanol (9CI)	10.11	6.	J
3.		Unknown hydrocarbon	16.67	1.	J
4.	110543	Hexane (8CI,9CI)	20.64	10.	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAD

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAD

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB123

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/25/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U
74-83-9	Bromomethane	5.	U
75-01-4	Vinyl Chloride	5.	U
75-00-3	Chloroethane	5.	U
75-09-2	Methylene_Chloride	.7	J B
67-64-1	Acetone	7.	B
75-15-0	Carbon Disulfide	3.	U
75-35-4	1,1-Dichloroethene	3.	U
75-34-3	1,1-Dichloroethane	3.	U
540-59-0	1,2-Dichloroethene_(total)	3.	U
67-66-3	Chloroform	3.	U
107-02-2	1,2-Dichloroethane	3.	U
78-93-3	2-Butanone	5.	U
71-55-6	1,1,1-Trichloroethane	3.	U
56-23-5	Carbon Tetrachloride	3.	U
108-05-4	Vinyl Acetate	5.	U
75-27-4	Bromodichloromethane	3.	U
78-87-5	1,2-Dichloropropane	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U
79-01-6	Trichloroethene	3.	U
124-48-1	Dibromochloromethane	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U
71-43-2	Benzene	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U
75-25-2	Bromoform	3.	U
108-10-1	4-Methyl-2-pentanone	5.	U
591-78-6	2-Hexanone	5.	U
127-18-4	Tetrachloroethene	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U
108-88-3	Toluene	3.	U
108-90-7	Chlorobenzene	3.	U
100-41-4	Ethylbenzene	3.	U
100-42-5	Styrene	3.	U
133-02-7	Xylene (total)	3.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
VBLKAD

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAD

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB123

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/25/91

GC Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.00	3.	J
2.	67630	2-Propanol (9CI)	10.11	6.	J
3.		Unknown hydrocarbon	16.67	1.	J
4.	110543	Hexane (8CI,9CI)	20.63	10.	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAE

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAE

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB133

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. ____ Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane		5.	U
74-83-9	Bromomethane		5.	U
75-01-4	Vinyl Chloride		5.	U
75-00-3	Chloroethane		5.	U
75-09-2	Methylene Chloride		1.	J
67-64-1	Acetone		5.	J
75-15-0	Carbon Disulfide		3.	U
75-35-4	1,1-Dichloroethene		3.	U
75-34-3	1,1-Dichloroethane		3.	U
540-59-0	1,2-Dichloroethene (total)		3.	U
67-66-3	Chloroform		3.	U
107-02-2	1,2-Dichloroethane		3.	U
78-93-3	2-Butanone		5.	U
71-55-6	1,1,1-Trichloroethane		3.	U
56-23-5	Carbon Tetrachloride		3.	U
108-05-4	Vinyl Acetate		5.	U
75-27-4	Bromodichloromethane		3.	U
78-87-5	1,2-Dichloropropane		3.	U
10061-01-5	cis-1,3-Dichloropropene		3.	U
79-01-6	Trichloroethene		3.	U
124-48-1	Dibromochloromethane		3.	U
79-00-5	1,1,2-Trichloroethane		3.	U
71-43-2	Benzene		3.	U
10061-02-6	trans-1,3-Dichloropropene		3.	U
75-25-2	Bromoform		3.	U
108-10-1	4-Methyl-2-pentanone		5.	U
591-78-6	2-Hexanone		5.	U
127-18-4	Tetrachloroethene		3.	U
79-34-5	1,1,2,2-Tetrachloroethane		3.	U
108-88-3	Toluene		3.	U
108-90-7	Chlorobenzene		3.	U
100-41-4	Ethylbenzene		3.	U
100-42-5	Styrene		3.	U
133-02-7	Xylene (total)		3.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKAE

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAE

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB133

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.96	3.	J
2.	67630	2-Propanol (9CI)	10.11	8.	J
3.		Unknown hydrocarbon	16.67	1.	J
4.	110543	Hexane (8CI9CI)	20.67	12.	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAF

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAF

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB144

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	5.	U
74-83-9	Bromomethane	5.	U
75-01-4	Vinyl Chloride	5.	U
75-00-3	Chloroethane	5.	U
75-09-2	Methylene Chloride	1.	JB
67-64-1	Acetone	6.	B
75-15-0	Carbon Disulfide	3.	U
75-35-4	1,1-Dichloroethene	3.	U
75-34-3	1,1-Dichloroethane	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U
67-66-3	Chloroform	3.	U
107-02-2	1,2-Dichloroethane	3.	U
78-93-3	2-Butanone	5.	U
71-55-6	1,1,1-Trichloroethane	3.	U
56-23-5	Carbon Tetrachloride	3.	U
108-05-4	Vinyl Acetate	5.	U
75-27-4	Bromodichloromethane	3.	U
78-87-5	1,2-Dichloropropane	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U
79-01-6	Trichloroethene	3.	U
124-48-1	Dibromochloromethane	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U
71-43-2	Benzene	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U
75-25-2	Bromoform	3.	U
108-10-1	4-Methyl-2-pentanone	5.	U
591-78-6	2-Hexanone	5.	U
127-18-4	Tetrachloroethene	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U
108-88-3	Toluene	3.	U
108-90-7	Chlorobenzene	3.	U
100-41-4	Ethylbenzene	3.	U
100-42-5	Styrene	3.	U
133-02-7	Xylene (total)	3.	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKAF

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAF

Sample wt/vol: 10 (g/mL) mL Lab File ID: >BB144

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 2/26/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	7.05	3.	J
2.	67630	2-Propanol (9CI)	10.15	8.	J
3.		Unknown hydrocarbon	16.68	1.	J
4.	110543	Hexane (8CI9CI)	20.68	10.	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKAG

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAG

Sample wt/vol: 10 (g/mL) mL Lab File ID: >CB021

Level: (low/med) LOW Date Received: --------

% Moisture: not dec. ____ Date Analyzed: 3/06/91

Column: (pack/cap) PACK Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L		Q
74-87-3	Chloromethane	5.	U	
74-83-9	Bromomethane	5.	U	
75-01-4	Vinyl Chloride	5.	U	
75-00-3	Chloroethane	5.	U	
75-09-2	Methylene_Chloride	3.	B	
67-64-1	Acetone	6.	B	
75-15-0	Carbon Disulfide	3.	U	
75-35-4	1,1-Dichloroethene	3.	U	
75-34-3	1,1-Dichloroethane	3.	U	
540-59-0	1,2-Dichloroethene_(total)	3.	U	
67-66-3	Chloroform	3.	U	
107-02-2	1,2-Dichloroethane	3.	U	
78-93-3	2-Butanone	5.	U	
71-55-6	1,1,1-Trichloroethane	3.	U	
56-23-5	Carbon Tetrachloride	3.	U	
108-05-4	Vinyl Acetate	5.	U	
75-27-4	Bromodichloromethane	3.	U	
78-87-5	1,2-Dichloropropane	3.	U	
10061-01-5	cis-1,3-Dichloropropene	5.	U	X
79-01-6	Trichloroethene	5.	U	X
124-48-1	Dibromochloromethane	5.	U	X
79-00-5	1,1,2-Trichloroethane	3.	U	
71-43-2	Benzene	3.	U	
10061-02-6	trans-1,3-Dichloropropene	3.	U	
75-25-2	Bromoform	3.	U	
108-10-1	4-Methyl-2-pentanone	5.	U	
591-78-6	2-Hexanone	10.	U	X
127-18-4	Tetrachloroethene	3.	U	
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	
108-88-3	Toluene	3.	U	
108-90-7	Chlorobenzene	3.	U	
100-41-4	Ethylbenzene	3.	U	
100-42-5	Styrene	3.	U	
133-02-7	Xylene (total)	3.	U	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKAG

Lab Name: CEP Contract: -------

Lab Code: ------- Case No.: ----- SAS No.: ----- SDG No.: ------

Matrix: (soil/water) WATER Lab Sample ID: VBLKAG

Sample wt/vol: 10 (g/mL) mL Lab File ID: >CB021

Level: (low/med) LOW Date Received: --------

% Moisture: not dec.____ Date Analyzed: 3/06/91

Column: PACK Dilution Factor: 1.00000

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.44	4.	J
2.		Unknown	7.10	6.	J
3.	67630	2-Propanol (9CI)	10.21	8.	J
4.	110543	Hexane (8CI9CI)	20.77	7.	J
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APPENDIX G

HEALTH AND ENVIRONMENTAL ASSESSMENT

G. HEALTH AND ENVIRONMENTAL ASSESSMENT

The Health and Environmental Assessment (HEA) is conducted to evaluate the impact of hazardous constituents present at the site. The HEA involves identifying the contaminants of concern, the concentrations of these compounds in the affected environmental media, and the risk to exposed or potentially exposed human or environmental receptors. The essential element of this assessment is the development of an appropriate set of health and environmental criteria to which the measured or predicted concentrations of toxic contaminants are compared. These criteria are primarily based on EPA-established chronic exposure limits. When the criteria are exceeded, there is a likelihood of adverse health or environmental effects, and additional measures may be required to prevent or reduce these effects.

G-1 Identification of Toxic Contaminants

Analyses of soil samples from a single borehole located near the northeast corner of building CPP-604 were conducted to determine the presence and concentration of inorganics, organics, and radionuclides in the soil at LDU CPP-33. The inorganic analysis results are presented in Table 6-2. Five of the analytes, arsenic, barium, chromium, selenium, and silver, did not exceed background concentrations or were not detected and are not included in this HEA. Cadmium, lead, and mercury were detected at concentrations greater than the background upper tolerance limit (UTL). A brief discussion of each contaminant is provided below.

Within the borehole, cadmium was detected at concentrations exceeding background at a depth of 21 to 25 feet and at all sampling depths from 39 feet to 113 feet. The maximum concentration detected was 11.2 mg/Kg (see Table 6-2). The primary route of exposure to cadmium for most people is from naturally occurring concentrations in food. Cigarette smoking is another nonoccupational source of cadmium. Cadmium can cause acute toxicity seen as respiratory distress and chemical pneumonitis from exposure to cadmium fumes. Acute toxicity from ingestion produces severe nausea and vomiting. Once cadmium enters the body by any route, it is strongly retained in the body and low doses accumulate, especially in the kidney. Long-term effects include kidney disease, lung cancer (from inhalation exposures), and possibly prostrate cancer. Cadmium is evaluated further in this HEA.

Lead was detected at a maximum concentration of 31.7 mg/Kg from a sample at a depth of 112 feet (see Table 6-2). Toxic effects can occur at blood lead levels so low as to be essentially without a threshold. The EPA recommends that neither a chronic reference dose nor a numerical cancer risk be used at this time to evaluate lead exposures (EPA, 1990a). However, epidemiological evidence indicates that a lead soil concentration of >500 mg/Kg is necessary to produce an increase in blood lead levels in children exposed to lead-containing soil (EPA, 1989b). Children are an example of a sensitive population because they are particularly susceptible to neurological changes from excess lead intake. Although the soil lead concentration of 31.7 mg/Kg at LDU CPP-33 exceeds the background UTL, this concentration is

significantly less than 500 mg/Kg. Therefore, lead is not considered further in this HEA.

Mercury is present at a concentration greater than the background UTL. This compound has a number of inorganic and organic derivatives, and toxicity is highly dependent on the form and route of exposure. Organic (alkyl) mercury compounds are generally more toxic by ingestion than inorganic (metallic) mercury. Target organs for toxic effects are the central nervous system and the kidney. Mercury has not been classified as to human carcinogenicity. Mercury is included in the HEA for LDU CPP-33.

One organic contaminant, trichloroethene, was detected during the sampling analyses for LDU CPP-33 at a very low concentration at a depth of 7 feet (see Table 6-3). Trichloroethene is a man-made solvent with multiple industrial and consumer product uses. High concentrations of trichloroethene, when inhaled, produce central nervous system effects such as dizziness, headache, and sleepiness. Chronic exposure in animals has produced liver, kidney, and lung cancer. However, this adverse effect has not been documented in humans (Proctor et al., 1988). Trichloroethene is included in the HEA for LDU CPP-33.

Results of the radiochemistry analysis are presented in Table 6-5 and Appendix E and are discussed in Section 6.5.4. A summary of the maximum concentrations of radionuclides detected at LDU CPP-33 and the threshold concentrations for these radionuclides is presented in Table G-1. The threshold concentration is that concentration of a radionuclide in soil that under any reasonable scenario (e.g., inadvertent ingestion, inhalation from resuspension, ingestion of food crops, and direct radiation) would result in an individual effective dose equivalent no greater than 25 mrem/yr (.25 msy/yr) (WHC-CM-7-5, Part K, Oct. 1, 1988).

The soil concentrations of cesium-137 and strontium-90 detected at LDU CPP-33 exceed their respective threshold concentrations. The maximum concentration of cesium-137 was 606 pCi/g, detected at a depth of 25 feet. The maximum concentration of strontium-90 was 328.8 pCi/g, detected at a depth of 17 feet. Both radionuclides exceeded their respective threshold concentrations at multiple depths within the borehole. Cesium-137 and strontium-90 are evaluated in this HEA.

TABLE G-1

SUMMARY OF RADIONUCLIDES
DETECTED AT LDU CPP-33

Radionuclide	Maximum Concentration Detected (pCi/g)	Depth (feet)	Threshold Concentration[a] (pCi/g)
Cesium 137	606	25	3
Neptunium 237	1.14	37	NA
Strontium 90	328.8	17	13
Uranium 234	0.51	47	100
Uranium 238	0.54	41	50
Americium 241	9.59	11	20
Plutonium 238	0.46	1	75
Plutonium 239/240	0.34	1	75

a From WHC-CM-7-5, Part K, October 1, 1988.
Also see "Development of Criteria for Release of INEL Sites Following Decontamination and Decommissioning (EG&G, Idaho, Inc. 1986).
b See Table 6-4, Results of clayey fracture fill material.
NA Not Available

G.2 Identification of Exposure Pathways

The contaminants of interest detected at LDU CPP-33 are cadmium, mercury, and trichloroethene. Soil samples were obtained at predetermined intervals from a single borehole. All contaminants were detected at very low concentrations. Mercury was the only contaminant for which the maximum concentration detected was in surface soils. In addition, within the borehole, there does not appear to be any trend with depth for the contaminants detected (i.e., increasing or decreasing concentrations with depth, or maximum concentrations for all contaminants detected at the same depth). Exposure through soil ingestion or dermal contact with the soils could occur for mercury. For cadmium and trichloroethene, found well below surface soils, this route of exposure is not viable unless the soils are disturbed or moved to the surface where more frequent contact would be possible.

The depth to groundwater (approximately 450 feet), the lack of surface water bodies in the vicinity of the disposal area, the apparently limited areal extent of associated contamination (based on site size and disposal

activities), and the low concentrations of contaminants detected preclude any significant impact on water from LDU CPP-33. Thus, neither surface water nor groundwater are considered as potentially viable exposure pathways.

The inhalation pathway is also an exposure route of minimal importance unless the soils are exposed, and even then an exposure scenario that would result in significant health risks due to contaminated airborne particulate is difficult to conceive given the low concentrations of contaminants detected in the soils and limited areal extent of contamination (i.e., absence of a significant source). For similar reasons, volatilization of trichloroethene from the soil could not occur at concentrations that would cause adverse health effects.

Although no exposure pathway is likely due to the depth to contamination for most contaminants, this HEA evaluates the ingestion and inhalation pathways to determine the health impacts from exposure to LDU CPP-33. Use of these pathways indicates the soils would have to be excavated or moved where workers at the ICPP could have frequent and ongoing exposure to the contaminants. Adverse health effects associated with exposure to the contaminants detected in the soil are inconceivable in the absence of direct, long term exposure to the soil itself.

G.3 Identification of Receptor Populations

The ICPP is a secured industrial site with limited access. LDU CPP-33 is located within a fenced area of the ICPP. The most likely receptors for contaminants present at LDU CPP-33 are maintenance and construction workers at the Tank Farm with direct access to the soil in the immediate vicinity of LDU CPP-33.

G.4 Human Health Assessment

As discussed in Section G-2, the soils would have to be excavated or moved where workers at the ICPP could have frequent and ongoing exposure to the contaminants through incidental soil ingestion, dermal contact, or inhalation, the potentially operative exposure pathways. Adverse health effects associated with exposure to the contaminants detected in the soil are inconceivable in the absence of direct, long-term exposure to the soil itself.

For the purposes of an initial screening, it is conservatively assumed that the soil is accessible to workers. Based on this assumption, the potential human health effects from the maximum concentrations of the contaminants of interest identified at LDU CPP-33 are assessed. The results of the assessment are summarized in Table G-2.

Cadmium and mercury are known to have systemic toxic effects if exposures are great enough. The soil concentrations, if ingested, that would result in an oral dose equivalent to the applicable chronic reference dose (RfD) for each contaminant were calculated as part of the assessment. The RfD for

TABLE G-2

SUMMARY OF HEALTH AND ENVIRONMENTAL ASSESSMENT FOR LDU CPP-33

Constituent	Maximum Detected Soil Concentration (mg/Kg)	Screening Criteria				
		Chronic Oral RfD (mg/Kg/d)	Soil Concentration = RfD (mg/Kg)	Oral Slope Factor $(mg/Kg/d)^{-1}$	Soil Concentration = 1E-06 Risk (mg/Kg)	TLV [a] (mg/m^3)
Inorganics						
Cadmium	11.2	1E-03[b]	80	-	-	0.01[c]
Mercury	1.51	3E-04[b]	24	-	-	0.1
Organics						
Trichloroethene	0.001	-	-	1.1E-02[b]	64	269[d]

(a) Threshold Limit Value (ACGIH, 1990-1991)
(b) EPA 1990b
(c) Proposed value for cadmium dusts and salts, as cadmium.
(d) NIOSH Recommended Exposure Limit is 25 ppm (135 mg/m^3)

a contaminant is the daily intake of the contaminant to which even a sensitive individual might be exposed without developing associated critical toxic effects. The following screening has been conducted in accordance with the RCRA Facility Investigation Guidance (EPA, 1989c) and the proposed rule for Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities (FR Vol. 55, No. 145 30798-30884).

The equation for calculating the soil screening criterion for systemic toxins (non-carcinogens) is given below:

$$CS = \frac{RfD \times BW}{IR \times CF}$$

where:

CS = Soil concentration screening criterion
RfD = Chronic Reference Dose
BW = Body Weight (16 kg)
IR = Ingestion Rate (200mg/day)
CF = Conversion Factor (1E-06 Kg/mg)

None of the soil concentrations detected exceed the maximum allowable soil concentrations based on the RfD (see Table G-2). Therefore, systemic adverse health effects should not occur in even sensitive individuals exposed to soil contaminants at the levels detected in the soils at LDU CPP-33.

If contaminants are carcinogens, then a second criterion is also calculated to evaluate the concentration of the contaminant present in the soil. For carcinogens, the criterion is based on the soil concentration, if ingested, that would be equivalent to an incremental cancer risk of 1E-06. An incremental cancer risk of 1E-06 or less is generally considered insignificant for regulatory purposes (40 CFR 300.430), and a risk between 1E-04 and 1E-06 is frequently the target level for remedial actions.

The equation for calculating the soil screening criterion for carcinogens is given below:

$$CS = \frac{Risk \times BW}{CSF \times IR \times CF}$$

where:

CS = Soil concentration screening criterion
Risk = Incremental Cancer Risk (1E-06)
BW = Body Weight (70 Kg)
CSF = Cancer potency factor
IR = Ingestion Rate (100 mg/day)
CF = Conversion Factor (1E-06 Kg/mg)

The carcinogenic screening process is conducted as recommended in the RCRA guidance and proposed rule as referenced above.

Cadmium and trichloroethene are the human carcinogens detected in the soil at LDU CPP-33. Cadmium, however, is only known to be carcinogenic when inhaled. Given the route-specific carcinogenic nature of cadmium and that the concentrations of cadmium that exceeded background are found at a depth greater than 41 feet, a cancer risk for the ingestion exposure route for cadmium is not provided. The concentration of trichloroethene detected in the soil does not exceed the screening criterion and thus does not pose an unacceptable cancer risk.

The airborne exposure pathway is potentially operative for both mercury-contaminated particulate since mercury is present in surface soils at levels exceeding background and for a volatile organic because trichloroethene was detected in the surface soil. Therefore, a third screening criterion is used to evaluate the soil concentrations of contaminants with respect to their potential contribution to airborne contamination levels. A commonly accepted occupational limit for substances in air is given by the Threshold Limit Value (TLV). The TLV is a recommended exposure level in air expressed as mg/M^3 (mass/volume) or ppm (volume/volume). The TLVs for all of the contaminants of interest are provided in Table G-2.

For mercury and cadmium, the contaminant concentrations detected in soil at LDU CPP-33 do not pose an inhalation toxicity hazard. Based on soil concentrations of these contaminants detected at LDU CPP-33, total airborne particulates (dust) would exceed the National Ambient Air Quality Standards for Particulates by at least four orders of magnitude before these contaminants would pose a health risk.

The TLV for trichloroethene is 269 mg/m^3 (ACGIH, 1990), and the maximum concentration preliminarily identified is 0.001 mg/Kg. Given this low soil concentration, the limited area of potential soil contamination (i.e., total mass of contaminated soil) and the published exposure limit for this compound, dispersion and diffusion of this volatile contaminant in the ambient air would result in air concentrations far below the TLV.

The contribution of dermal contact exposures to the overall health risk, although not quantitatively evaluated, would be inappreciable compared to the ingestion or inhalation routes because of the low levels of soil contamination, the lack of ongoing access to the soils, and the depth of the soil contamination, especially for cadmium and trichloroethene.

Based on the results of the screening presented above, adverse health impacts to workers in the vicinity of or with direct access to LDU CPP-33 would not occur from the contaminant concentrations detected for non-radioactive contaminants.

G.4.2 Radioactive Contaminants

Cesium-137 and strontium-90 were detected at concentrations exceeding their respective threshold concentrations. All radionuclides are classified by EPA as human carcinogens. Acceptable exposure levels based on carcinogenic risk for a specific substance are typically much lower than those based on systemic toxicity for the same substance and hence, only carcinogenic risk is evaluated. The standard equation for evaluating risk from exposure to radioactive contaminants, as presented in EPA 1991, is:

$$\text{Medium-specific activity} = \frac{\text{RISK}}{\text{Unit risk}}$$

where:

Medium-specific activity = pCi/m^3 in air or
pCi/g in soil or
pCi/g in soil (external exposure)

RISK = Increased lifetime cancer risk
Unit risk = Medium-specific and radionuclide specific unit risk

As with chemical carcinogens, the target risk for screening purposes is the 1E-06 excess individual cancer risk. All parameters required for use of the above equations are provided in EPA 1991. The EPA does not recommend replacing or substituting other default values at this time. The slope factors and unit risks are derived from models that consider pathways of exposure, the distinct metabolic behavior of each element by compound, and the radiological characteristics of each nuclide, the time and duration of exposure, the radiosensitivity of each target organ in the body, the latency period of cancer expression in these organs, and the age and sex of individuals in exposed populations. Therefore, for purposes of evaluating the radioactive contaminants detected at LDU CPP-33, all exposure parameters are identical for either an occupational or a residential scenario. The assessment of risk from external exposure should also include a calculation of the risk from any radionuclides formed during radioactive decay since the external exposure factors presented in EPA 1991 do not include contributions from decay products.

The risk from the inhalation of radioactively contaminated respirable particulate is based on the measured concentration of respirable particulate matter in the air at the INEL as provided in "The Idaho National Engineering Laboratory Site Environmental Report for Calendar Year 1989," DOE/ID-12082(89), June 1989. The 95% upper confidence interval for the mean air respirable particulate concentration is 0.019 mg/m^3. It is conservatively assumed that all particulates in the air are derived from the LDU CPP-33 soil and that the contaminant concentration of the particulate in the air directly corresponds to the contaminant concentration in the soil.

Consequently, a factor of 0.000019 g/m^3 (0.019 mg/m^3) is used in calculating exposure to airborne radionuclide particulates.

The EPA has recently published new standard default exposure parameters for non-radioactive compounds that utilize an exposure duration of less than 70 years for both occupational and residential exposures. The HEA may require refinement as additional information is made available regarding the use of these new parameters for calculating unit risks and evaluation of risks associated with radionuclide exposures. The use of these new parameters would be expected to indicate that potential risks are less than those presented here.

A summary of the estimated incremental cancer risks for exposure to the maximum concentrations of cesium-137 an strontium-90 detected at LDU CPP-33 are presented in Table G-3. As discussed in Sections G-2 and G-4, the soils would have to be moved where workers at the ICPP could have frequent and ongoing exposure to the contaminants in order for adverse health effects associated with these radionuclides to occur. Therefore, the estimated risks presented in Table G-3 are much higher than will realistically occur because the maximum contaminant concentrations are not located at the surface where direct contact with contaminated soil or external exposure from gamma radiation would occur.

All risks are within the 1E-04 to 1E-06 range except the risk associated with external exposure to cesium-137 if the maximum concentration was located at the surface. However, cesium-137 was not detected in surface soils. Therefore, external exposure would not occur unless contaminated soil were excavated to the surface thus making external exposure possible.

G.5 Environmental Assessment

LDU CPP-33 is located within the controlled and fenced boundaries of the ICPP. The soil contaminants have been preliminarily identified in surface soils (mercury) and at varied depths for the other contaminants. LDU CPP-33 does not support any vegetation in the area of detected contamination. Large animals and migratory wildlife have no access to or are not known to frequent the immediate area surrounding LDU CPP-33. Consequently, no adverse impact on terrestrial biota should occur.

The airborne transport of contaminants located in the soils at LDU CPP-33 will be insignificant because of the low levels of contaminants present in the soil and the probable limited area of contamination (i.e. absence of a significant source). Thus, environments downwind from the area will not be significantly impacted via the air pathway.

Identification of contaminants and concentrations indicate that surface water and groundwater will not be significantly impacted by the levels of radioactive or non-radioactive soil contamination detected at LDU CPP-33.

TABLE G-3

SUMMARY OF HEALTH AND ENVIRONMENTAL ASSESSMENT FOR
RADIOACTIVE CONTAMINANTS AT LDU CPP-33

Constituent	Maximum Detected Soil Concentration (pCi/g)	Depth (feet)	Incremental Cancer Risk[a]		
			Soil Ingestion[b]	Inhalation[c]	External Exposure[d]
Cesium-137	606	25	5E-05	1E-07	2E-01[e]
Strontium-90	328.8	17	3E-05	2E-07	NA

[a] Based on 70 years exposure

[b] Unit RisK: Cesium-137 = 7.6E-08 $(pCi/g)^{-1}$; Strontium-90 = 8.9E-08 $(pCi/g)^{-1}$

[c] Unit Risk: Cesium-137 = 9.6E-06 $(pCi/m^3)^{-1}$; Strontium-90 = 2.8E-05 $(pCi/m^3)^{-1}$

[d] Unit Risk: Cesium-137 = 3.4E-04 $(pCi/g)^{-1}$; Strontium-90 = 0.0E+00 $(pCi/g)^{-1}$

[e] Presented for information purposes only. Depth to maximum concentration precludes exposure that would result in this level of risk.

NA = Not applicable

The radioactive contaminants exceeding threshold concentrations have limited mobility in soil an relatively short half-lives. Without additional driving forces, these contaminants should not reach groundwater and, even at the concentrations detected, would not impact the groundwater sufficiently to produce a significant health risk. Low annual rainfall will result in little surface runoff or infiltration to transport contaminants, and noadditional release into the soil will occur. These conditions in addition to the depth to groundwater (approximately 450 feet) and low level of soil contamination will limit migration of contaminants and any adverse effects on surface waters or groundwater in the vicinity of LDU CPP-33.